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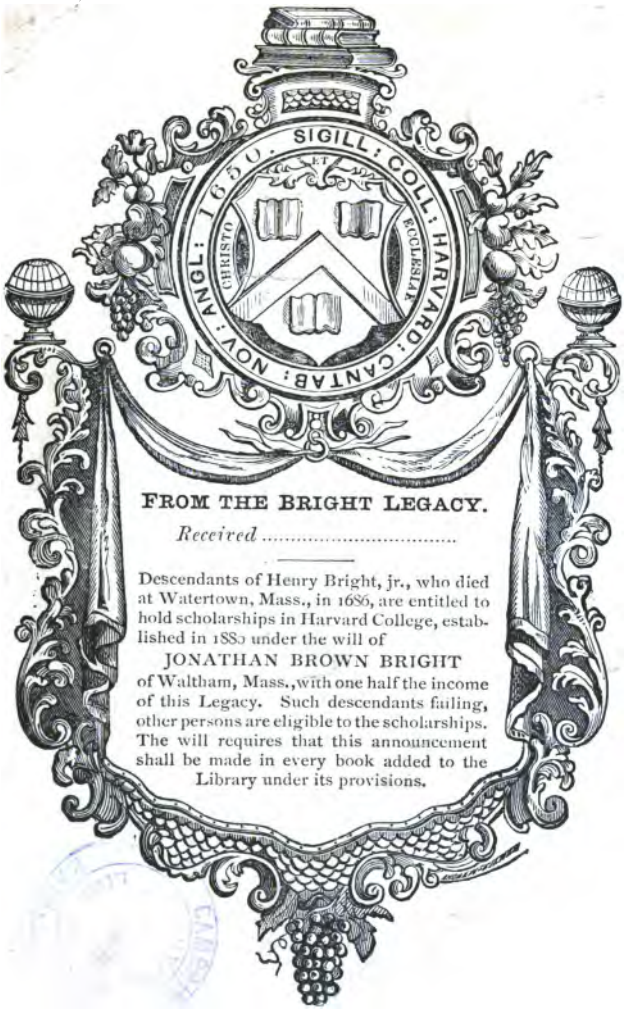


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JONATHAN BROWN BRIGHT

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# MEXICO

FROM THE

# MATERIAL STAND-POINT.

A REVIEW OF ITS MINERAL, AGRICULTURAL, FOREST, AND MARINE WEALTH, ITS MANUFACTURES, COMMERCE, RAILWAYS, ISTHMIAN ROUTES AND FINANCES. WITH A DESCRIPTION OF ITS HIGHLANDS AND ATTRACTIONS.

ILLUSTRATED WITH MAPS AND DIAGRAMS.

BY

ALEX. D. ANDERSON,

AUTHOR OF "THE SILVER COUNTRY, OR GREAT SOUTHWEST;" "THE TEHUANTEPEC INTER-OCEAN RAILWAY," AND "THE AMERICAN AND MEXICAN-PACIFIC RAILWAY."

WASHINGTON, D. C.
A. BRENTANO & CO.
NEW YORK,
BRENTANO BROS., 5 UNION SQUARE.
1884.

mate business? Will it pay? Will the railway and mining capitalists who have invested so heavily in that country, and who must spend at least two or three hundred million dollars more to complete the enterprises already commenced, derive adequate profits from their investments? Is the material and political welfare of Mexico a matter of interest and importance to us as a nation?

To answer these questions is the object of the following pages.

Mexico, we claim, is one magnificent but undeveloped mine—our India in commercial importance—our Cuba and Brazil in tropical products—our complement in general characteristics, resources, supply, and demand—our Italy in climate and attractions—our Troy in antiquities and classic history—and our sister Republic, friend, and ally in international politics. It is all and more than Cortez dreamed when, early in the sixteenth century, he determined to conquer the Aztec Empire, and add its treasures to the glory of Spain. It will, on the completion of its isthmian highways between Oceans and Republics—to use an expression which Baron Humboldt applied to Mexico many years ago—become "the bridge of the commerce of the world."

In support of this view we herewith present a plain statement of facts, collected from official and other standard sources, and prepared in legal-brief style, with a citation of authorities. It is, of course, but an outline review, for a detailed statement of the characteristics, resources, and attractions of Mexico would fill several large volumes.

Hoping the generalities we have presented may stimulate a desire for further information about this favored land, we have given in the Appendix a full list of English and American authorities.

The contour lines of the three classes of elevations on the map preceding Chapter I are copied from an hypsometric map by E. G.

Ravenstein, published in J. L. Geiger's work on Mexico. London, 1874.

The list of railway concessions in Chapter IX was specially prepared for this work by Robert B. Gorsuch, Esq., of the city of Mexico.

ALEX. D. ANDERSON.

CORCORAN BUILDING,

WASHINGTON, D. C., *February*, 1884.

# CONTENTS.

## I.

### DESCRIPTIVE NOTES.


PAGE.

Map of Highlands ..... 13
Description of Highlands ..... 13
Population by Elevations ..... 14
Climate and Health ..... 15
Area and Contrasts ..... 19
Population and Contrasts ..... 20
Races ..... 21


## II.

### MINERAL WEALTH.


Silver and Gold—

- Treasures of the Toltecs and Aztecs ..... 24
- Mining by the Toltecs and Aztecs ..... 26
- Products, 1521–1804 ..... 28
- Products, 1804–1848 ..... 29
- Products, 1848–1884 ..... 29
- Summary of Products ..... 30
- Products by States ..... 31
- Progress of Mining ..... 32
- Future Products ..... 33

Iron—

- View of Iron Mountain ..... 34
- Description of Iron Mountain ..... 35

Coal—

- Its importance ..... 37
- Deposits in Southern Texas ..... 37
- Deposits in Northern Mexico ..... 38
- Deposits near City of Mexico ..... 42
- Other Deposits ..... 44

Petroleum and Asphaltum ..... 45
Other Mineral Wealth ..... 49

## III.

### AGRICULTURAL WEALTH.

PAGE.
General Notes ..... 52
Wheat and Corn ..... 54
Tobacco ..... 59
Sugar ..... 59
Coffee ..... 62
Cotton ..... 65
Grazing ..... 68
Tropical Fruits ..... 70
Other Agricultural Wealth ..... 73
Its New Development ..... 78

## IV.

### FOREST WEALTH.

At the Isthmus ..... 80
In Northern Mexico ..... 82
In Central Mexico ..... 83
Importance of the Subject ..... 84

## V.

### MARINE WEALTH.

Abundance and Variety of Fish ..... 85
Oyster Fisheries ..... 87
Pearl Fisheries ..... 87
Whale Fisheries ..... 88
Seal Fisheries ..... 89
Turtle Fisheries ..... 89
Salt Deposits ..... 89
Guano Islands ..... 90

## VI.

### MANUFACTURES.

Cotton and Woollen ..... 91
Iron ..... 92
Silk ..... 92
Paper ..... 93
Silver and Gold ..... 95
Other Manufactures ..... 95

## VII.

### COMMERCE.

PAGE.
Rank among Nations ..... 96
Trade with the World ..... 97
What Mexico Sells ..... 97
What it Buys ..... 98
Where it Sells ..... 98
Where it Buys ..... 99
Trade with the United States—
Natural facilites ..... 99
Reciprocal Free Trade ..... 99
A Statistical Summary ..... 100
What Mexico buys ..... 102
What it sells ..... 102
Future Trade and Rank ..... 103

## VIII.

### RAILWAYS.

Map of Existing and Projected Lines ..... 105
Necessity for their Construction ..... 105
Mileage required ..... 106
Facilities for Construction and Operation ..... 106
List of Concessions ..... 107
Description of Principal Lines ..... 114
Will they Pay? ..... 115

## IX.

### "THE BRIDGE OF THE COMMERCE OF THE WORLD."

Diagram of Inter-Ocean Route ..... 118
The Tehuantepec Inter-Ocean Route ..... 118
Its importance to Mexico ..... 119
Its importance to the United States ..... 119
The Inter-Republic Route ..... 124

## X

### NATIONAL FINANCES.

The Old Debt ..... 126
Contrast with Debts of other Nations ..... 126
New Obligations ..... 127
Revenues ..... 127

## XI.

### ATTRACTIONS.

PAGE.
Highland Homes....129
Antiquities....130
The Paris of America....132
A Favorite Resort....133
Money spent by Americans in Europe....134
Its Deflection to Mexico....135

## XII.

### INTER-REPUBLIC POLITICS.

A Political Parallel....137
Mexico's Regard for Us....137
Railway Concessions in illustration....138
Our Regard for Mexico....138
Sentiments of Prominent Americans....138

## APPENDIX.

List of American and English Authorities....143

I.

# DESCRIPTIVE NOTES.

## Highlands.

"On the high lands men feel the loftiest emotions. Every tradition places their origin there. The first nations worshipped there. High on the Indian Caucasus, on Olympus, and on other lofty mountains the Indians and the Greeks imagined the abodes of their highest gods; while they peopled the low underground regions, the grave-land of mortality, with infernal deities. These myths have a deep signification. Man feels his immortality in the hills."

*From report by* Dr. WILLIAM FARR *to the Registrar-General of England.*[1]

MEXICO is pre-eminently a country of highlands. Nearly all of its great interior is elevated from three to eight thousand feet, and in some few places more, above the level of the sea, the average elevation being at least five thousand feet.

By reference to the map on the preceding page it will be observed that the hot low lands along the sea coast comprise but a small portion of its area. The next class of elevations—a narrow strip rising abruptly from one to three thousand feet, diverging at the Isthmus of Tehuantepec and running parallel with the two coasts—represents substantially the mountain ranges which inclose the table-lands, and make the ascent from the seaboard to the interior cities and states usually very difficult. The third class, designated in blue—the highlands elevated three thousand feet and more above the level of the sea—is the favorite portion of Mexico, and the seat of its principal cities and densest population. Years ago that close observer of nature, Baron Humboldt, in describing the interior plateau of Mexico prior to its cessions to the United States in 1848, said: "We are led to ask whether, in the whole world, there exists any similar formation of equal extent and height, (between five thousand and seven thousand feet above the level of the sea.) Four-wheeled wagons can travel from Mexico to Santa Fé. The plateau whose levelling I have here described is formed solely by the broad, undulating, flattened crest of the chain of the Mexican Andes. It is not the swelling of a valley between two mountain chains."[2]

[1] "Report on the Mortality of Cholera in England, 1848–9," by Wm. Farr. London: 1852, page 94.

[2] Views of Nature, p. 209.

We do not, however, wish to be understood as asserting that these highlands are one level plain, for they have different grades of elevation, are intersected by ridges and valleys, and occasionally dotted with mountain peaks. Extending from north to south through the central portion of Mexico is a wide belt elevated more than 6,000 feet above the sea. The general course of this whole formation and its various subdivisions is lengthwise through the Republic. The highest elevations being in the centre the drainage of Mexico is from the interior towards the coasts on the east and west, being in marked contrast with the great interior of the United States, which is a valley receiving the drainage from the mountain slopes on either side.

The highlands gently decline toward the border of the United States —one part gradually rising again in its course through New Mexico and the other disappearing in the plains of Texas, thus furnishing easy grades for commercial highways between the two adjoining nations.

## Population by Elevations.

Three-fourths the total population of Mexico dwell in the mild and equable climate—the pure air and sunshine of these highland homes.

In this respect it is the exact reverse of our own country, where the population is mainly upon the low lands in the Mississippi Valley and along the seaboard. According to the United States Census Report for 1880, "one-fifth of the inhabitants live below 100 feet—*i. e.*, along the immediate seaboard and in the swampy and alluvial regions of the South; more than two-fifths below 500 feet; more than three-fourths below 1,000 feet, while 97 per cent. live below 2,000 feet."

The remarkable contrast in this respect between the two Republics may be further illustrated by the following table showing the elevation above the sea of fifteen principal cities of each country:[1]

[1] The list of elevations of the United States cities was supplied by Henry Gannett, Esq., of the U. S. Geological Survey.

That of Mexican cities is taken chiefly from "Anales del Ministerio de Fomento" for year 1881.

Authorities differ very widely in regard to the population of the cities of Mexico, but after careful research it is believed the population of the fifteen cities given on the map preceding this chapter is substantially correct. Possibly one or two other cities are entitled to rank among the first fifteen.

| *Cities.* | *Elevation, in feet.* | *Cities.* | *Elevation, in feet.* |
|---|---|---|---|
| 1. New York | 22 | Mexico | 7,349 |
| 2. Philadelphia | 14 | Leon | 5,935 |
| 3. Brooklyn | 20 | Puebla | 7,053 |
| 4. Chicago | 585 | Guadalajara | 5,078 |
| 5. Boston | 12 | Guanajuato | 6,838 |
| 6. St. Louis | 413 | Zacatecas | 8,040 |
| 7. Baltimore | 131 | San Luis Potosi | 5,905 |
| 8. Cincinnati | 523 | Toluca | 8,792 |
| 9. San Francisco | 60 | Merida | 0,000 |
| 10. New Orleans | 16 | Morelia | 6,417 |
| 11. Cleveland | 583 | Monterey | 1,624 |
| 12. Pittsburg | 776 | Aguas Calientes | 6,261 |
| 13. Buffalo | 583 | Queretaro | 6,363 |
| 14. Washington | 27 | Oaxaca | 5,072 |
| 15. Newark | 13 | Campeche | 0,000 |
| Average elevation | 252 | | 5,315 |

It will be observed that the average elevation of the Mexican cities is more than 5,000 feet, or twenty-one times that of the cities of the United States. It is believed the average elevation would be equally great if the list was extended so as to include the thirty principal cities. Omitting from the list Merida and Campeche, which are at sea level, the average elevation of the remaining thirteen, which are interior cities, is upwards of 6,000 feet.

## Climate and Health.

There seems to be in the United States, even among people otherwise well informed, a general misapprehension about the climate of Mexico. The error naturally arises from associating southern latitudes with a hot climate. They are either unaware or forget that the chief portion of Mexico is very highly elevated, and that the chief portion of its population dwell upon these highlands. They read the newspaper accounts of the ravages of yellow fever along the sparsely settled and narrow strip of low lands bordering the Gulf of Mexico, and erroneously apply those facts to Mexico as a whole. Nothing could be more erroneous or unintentionally unjust. One might as well apply the hot climate and yellow fever epidemics of some portions of our Gulf coast to the United States as a whole.

Baron Humboldt, who visited Mexico about the beginning of the

present century and made a careful and scientific study of its characteristics, said of its climate: "We know, however, that the physical climate of a country does not altogether depend on its distance from the pole, but also on its elevation above the level of the sea, proximity to the ocean, configuration, and a great number of other local circumstances. Hence, of the 50,000 square leagues situated in the torrid zone more than three-fifths enjoy rather a cold or temperate than a burning climate." * * * "The influence of geographical position is absorbed in the effect of this elevation."[1]

Dr. Wm. Farr, in an elaborate report to the Registrar-General of England, in writing of the "salubrity of high places,"[2] makes the following very pointed contrast:

"The four great pestilential diseases—cholera, yellow fever, remittent fever, and plague—have this property in common: that they begin and are most fatal in low grounds; that their fatality diminishes in ascending the rivers and is inconsiderable around the river sources, except under such peculiar circumstances as are met with at Erzeroum, where the features of a marshy sea-side city are seen at the foot of the mountain chain of Ararat. Safety is found in flight to the hills."

* * * * * * * *

"As the power of the Egyptians descended from the Thebaid to Memphis, from Memphis to Sais, they gradually degenerated, notwithstanding the elevation of their towns above the high waters of the Nile, their hygienic laws and the hydrographical and other sanitary arrangements which made the country renowned, justly or unjustly, for its salubrity in the days of Heroditus, the poison of the Delta in every time of weakness and successful invasion gradually gained the ascendancy, and as the cities declined the canals and the embalmments of the dead were neglected, the plague gained ground. The people, subjugated by Persians, Greeks, Romans, Turks, Mamelukes, became what they have been for centuries, and what they are in the present day.

"Every race that settled in the Delta [of the Nile] degenerated, and was only sustained by immigration. So, likewise, the populations on the sites of all the city-states of antiquity, on the coast of Syria, Asia Minor, Africa, Italy, seated like the people of Rome on low ground under the ruin-clad hills of their ancestors, within reach of fever and plague, are enervated and debased apparently beyond redemption.

[1] Political Essay on New Spain, vol. I, pp. 47, 48, and 68.

[2] "Report on the Mortality of Cholera in England," pp. 93 and 94.

"The history of the nations on the Mediterranean, on the plains of the Euphrates and the Tigris, the deltas of the Indus and Ganges, and the rivers of China, exhibit this great fact, the gradual descent of races from the highlands, their establishment on the coasts in cities sustained and refreshed for a season by immigration from the interior; their degradation in successive generations under the influence of the unhealthy earth, and their final ruin, effacement, or subjugation by new races of conquerors. The causes that destroy individual men lay cities waste, which, in their nature, are immortal, and silently undermine eternal empires.

"On the high lands men feel the loftiest emotions. Every tradition places their origin there. The first nations worshipped there. High on the Indian Caucasus, on Olympus, and on other lofty mountains the Indians and the Greeks imagined the abodes of their highest gods; while they peopled the low underground regions, the grave-land of mortality, with infernal deities. These myths have a deep signification. Man feels his immortality in the hills."

How well these remarks about "the salubrity of high places" in the Old World apply to the highlands of Mexico may be seen from the following testimony of a careful writer on that country: "To the 'hot lands' succeed in vertical position the '*tierras templadas*,' or temperate lands, which comprise all the higher terraces and the central plateaus themselves between about 3,000 and 8,000 feet. With a mean temperature of from 62° to 70° Fahrenheit, and oscillating between such moderate extremes as 50° and 86°, this region enjoys one of the very finest climates on the globe. The Puebla and Anahuac table-lands are described by enthusiastic travellers as a 'terrestrial Eden,' with a perennial spring symbolized by the evergreen oak, cedars, and many analagous plants, which here attain their greatest perfection. The transition from the lower zone is often very gradual; and while endemic fevers cease altogether at altitudes of 2,700 and 2,800 feet, the tropical flora invades many parts of the terrace lands and even of the plateaus to heights of 4,000 and 5,000 feet."[1]

The cases are doubtless very exceptional where yellow fever in Mexico reaches an elevation of 2,700 or even 2,000 feet, for, according to that eminent authority, Dr. Toner, former president of the American Medical Association, "the disease has in the United States never in epidemic form reached an elevation of 500 feet."[1] He also cites the opinion of

[1] From article on Mexico in new edition of Encyclopædia Britannica.

Major Tullock, of the British army, to the effect that yellow fever was never known in any climate at an elevation of 2,500 feet.

The mean temperature (Fahrenheit) during the year 1881 of five leading cities representing different portions of the highlands was as follows: [2]

| *Cities.* | *Elevation in feet.* | *Winter temperature.* | *Summer temperature.* |
|---|---|---|---|
| | | ° | ° |
| Mexico | 7,349 | 55.6 | 63.6 |
| Leon | 5,939 | 59.0 | 70.2 |
| Puebla | 7,053 | 54.2 | 64.2 |
| Zacatecas | 8,040 | 54.9 | 65.5 |
| Oaxaca | 5,072 | 62.8 | 70.0 |

United States Consul-General Strother, in an official report to our State Department, gives the following "lowest temperature" reported from several places, and showing the variety of climate in the Mexican Republic, December 14, 1882:

| | °F. | | °F. |
|---|---|---|---|
| Mexico | 41 | Querétaro | 52 |
| Zacatecas | 41 | Puebla | 54 |
| Morelia | 41 | Mazatlan | 59 |
| Pabellon | 46 | Chilpancingo | 61 |
| San Luis Potosi | 48 | Iguala | 63 |
| Guanajuato | 48 | Vera Cruz | 72 |
| Guadalajara | 48 | Monterey | 73 |

The above table, as will be observed, includes a few seaboard as well as interior cities.

Of the temperature of the city of Saltillo, situated in still another portion of the high lands and elevated 5,240 feet above the level of the sea, United States Consul Wadsworth reports to the State Department as follows:

"The climate, dry, equable, and salubrious, is unsurpassed on this continent, as will be apparent by examination of the following table. From daily observation of the thermometer, (Fahrenheit,) which I took

[1] Report of Supervising Surgeon of Marine Hospital Service of U. S. for 1873.

[2] From records of U. S. Signal Service office.

for three years, I have calculated the mean monthly temperature for the year, under shelter, in the shade, as follows:"

*Mean monthly temperature (Fahrenheit) from three years' observations*—1878–'79–'80.

| *Months.* | *Sunrise.* | *Noon.* | *Sunset.* | *Extremes.* | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Lowest.* | | | *Highest.* | | |
| | ° | ° | ° | ° | ° | ° | ° | ° | ° |
| January | 66 | 72 | 69 | 54 | 55 | 58 | 70 | 74 | 70 |
| February | 64 | 68 | 66 | 60 | 62 | 62 | 68 | 76 | 70 |
| March | 67 | 71 | 69 | 63 | 68 | 68 | 72 | 78 | 71 |
| April | 71 | 75 | 73 | 64 | 68 | 68 | 74 | 82 | 78 |
| May | 75 | 79 | 79 | 72 | 72 | 72 | 80 | 86 | 83 |
| June | 74 | 79 | 78 | 72 | 77 | 76 | 78 | 85 | 84 |
| July | 71 | 77 | 75 | 68 | 72 | 73 | 74 | 83 | 86 |
| August | 72 | 77 | 75 | 68 | 69 | 68 | 75 | 80 | 78 |
| September | 67 | 72 | 70 | 58 | 60 | 60 | 70 | 81 | 76 |
| October | 69 | 75 | 62 | 61 | 64 | 64 | 74 | 81 | 76 |
| November | 62 | 67 | 64 | 58 | 64 | 61 | 70 | 73 | 70 |
| December | 57 | 60 | 58 | 52 | 50 | 54 | 61 | 70 | 64 |

Of the temperature of that portion of Mexico elevated more than seven thousand feet above the level of the sea another authority states: "This region tempered by cold has a mean temperature similar to that of Lombardy, 67° Fahr., but heat and cold less excessive and very healthy."[1]

In view of this mass of testimony cited from standard authorities, and much more that might be produced to the same effect, we are led to conclude that the highlands of Mexico offer to the surplus population of other countries unusual attractions in climate and health and the possibilities of an advanced civilization.

## Area and Contrasts.

The total area of Mexico is 741,791 square miles, or larger than the combined areas of the German Empire, France, England, Spain, Ireland, Scotland, Greece, and Belgium. It is equal to 25 per cent. the total area of the United States, exclusive of Alaska.

[1] From A. Keith Johnston's Dictionary of Geography. London: 1877.

The relative rank of the several Mexican states in area may be seen from the following table, to which, for purposes of contrast, we have added corresponding areas of a few American and European states and countries: [1]

| | *Mexican States.* | *Area in square miles.* | *American and European States with approximately corresponding areas.* | *Area in square miles.* |
|---|---|---|---|---|
| 1. | Chihuahua | 83,727 | Utah | 82,190 |
| 2. | Sonora | 78,997 | Minnesota | 79,205 |
| 3. | Ter'y of Lower California | 61,544 | Georgia | 58,980 |
| 4. | Coahuila | 50,889 | England | 50,922 |
| 5. | Durango | 42,498 | Ohio | 40,760 |
| 6. | Jalisco | 39,163 | Virginia | 40,125 |
| 7. | Sinaloa | 36,189 | Indiana | 35,910 |
| 8. | Oaxaca | 33,571 | Portugal | 34,595 |
| 9. | Tamaulipas | 30,225 | Scotland | 30,685 |
| 10. | Yucatan | 29,560 | Maine | 29,895 |
| 11. | San Luis Potosi | 27,494 | Greece and New Jersey | 27,473 |
| 12. | Vera Cruz | 26,225 | Wales and Servia | 26,000 |
| 13. | Campeche | 25,827 | West Virginia and Rhode Isl'd | 25,730 |
| 14. | Guerrero | 24,544 | West Virginia | 24,645 |
| 15. | Michoacan | 23,707 | Denmark and Vermont | 23,919 |
| 16. | Nuevo Leon | 23,626 | Wales and Switzerland | 23,127 |
| 17. | Zacatecas | 22,992 | Greece | 20,018 |
| 18. | Chiapas | 16,042 | Switzerland | 15,908 |
| 19. | Puebla | 12,015 | Netherlands | 12,727 |
| 20. | Tabasco | 11,846 | Belgium | 11,369 |
| 21. | Guanajuato | 11,409 | Vermont and Delaware | 11,095 |
| 22. | Hidalgo | 8,158 | Massachusetts | 8,040 |
| 23. | Mexico | 7,837 | New Jersey | 7,455 |
| 24. | Colima | 3,746 | Connecticut | 4,845 |
| 25. | Queretaro | 3,205 | Delaware and Rhode Island | 3,045 |
| 26. | Aguas Calientes | 2,895 | Holland | 2,094 |
| 27. | Morelos | 1,776 | Delaware | 1,960 |
| 28. | Tlaxcala | 1,621 | Rhode Island | 1,085 |
| 29. | Federal District | 463 | District of Columbia, (7 times) | 420 |

## Population and Contrasts.

The total population of Mexico in 1880 was 9,908,011, or 13.3 to every square mile. That of the United States in the same year was 50,155,783, or 16.8 to the square mile. As Mexico has 25 per cent. of our area, it should, to be on a level with us in density of population, have 12,538,945 inhabitants.

[1] Mexican areas from A. Keith Johnston's Dictionary of Geography.

The relative rank of the various states in population is as follows:[1]

| | | | |
|---|---|---|---|
| 1. Jalisco | 983,484 | 16. Nuevo Leon | 203,284 |
| 2. Guanajuato | 834,845 | 17. Queretaro | 203,250 |
| 3. Puebla | 784,466 | 18. Durango | 190,846 |
| 4. Oaxaca | 744,000 | 19. Sinaloa | 186,491 |
| 5. Mexico | 710,579 | 20. Morelos | 159,160 |
| 6. Michoacan | 661,534 | 21. Aguas Calientes | 140,430 |
| 7. Vera Cruz | 542,918 | 22. Tamaulipas | 140,137 |
| 8. San Luis Potosi | 516,486 | 23. Tlaxcala | 138,988 |
| 9. Hidalgo | 427,350 | 24. Coahuila | 130,026 |
| 10. Zacatecas | 422,506 | 25. Sonora | 115,424 |
| 11. Federal District | 351,804 | 26. Tabasco | 104,747 |
| 12. Yucatan | 302,315 | 27. Campeche | 90,413 |
| 13. Guerrero | 295,590 | 28. Colima | 65,287 |
| 14. Chihuahua | 225,541 | 29. Ter'y of Lower California. | 30,208 |
| 15. Chiapas | 205,362 | | |

## Races.

The classification of races as given in "*Anales del Ministerio de Fomento*" for 1880 is as follows:

| | | *Per ct.* |
|---|---|---|
| European and Spanish-American | 1,882,522 | 19 |
| Indian | 3,765,044 | 38 |
| Mixed | 4,260,445 | 43 |
| | 9,908,011 | 100 |

A statement somewhat different and more in detail is given in an elaborate paper on Mexico in the new and recently-published edition of *Encyclopædia Britannica*, as follows:

| | |
|---|---|
| 1. Full-blood Indians | 5,000,000 |
| 2. Mestizoes, (half-caste Indians and whites) | 3,000,000 |
| 3. Creoles, (whites of Spanish descent) | 1,500,000 |
| 4. Gachupines, (Spanish by birth) | 50,000 |
| 5. Other Europeans and Americans | 100,000 |
| 6. Full-blood negroes | 10,000 |
| 7. Zambos or "chinos," (Indo-Africans) | 45,000 |
| 8. Mulattoes, (Eurafricans) | 5,000 |

[1] Anales del Ministerio de Fomento for 1881, page 94.

In this connection it may be interesting to note the classfication of races in the United States. According to the Census of 1880, it was:

| | |
|---|---|
| White | 43,402,970, or 86.5 per ct. |
| Colored | 6,580,793, or 13.1 per ct. |
| Chinese | 105,465, or 00.2 per ct. |
| Indian | 66,407, or 00.1 per ct. |
| Japanese | 148, or —— per ct. |

By contrasting the last two tables it will be seen that half of the population of Mexico is Indian, while in the United States this race constitutes but a little more than one-tenth of one per cent. In Mexico less than one per cent., and in the United States thirteen per cent. of the total population is colored.

In making this contrast, however, it should be remembered that the Indians of the United States are chiefly wild tribes, while in Mexico they are mainly civilized nations.

Bancroft, the historian of "The Native Races," has devoted one large volume to the civilized Indians of Mexico and Central America, and to this admirable work the reader is referred for detailed information which of course cannot be given in the space of a commercial brief. We quote the following concise paragraph from the publisher's prospectus accompanying that work to illustrate the advanced civilization of the Mexican Indian at the time of the conquest by Cortez. It says:

"On the table-lands of Mexico and Central America the first Spaniards found nations well advanced in science, art, and literature—nations that laid out large cities in streets and squares with public market-places; nations that built magnificent palaces and temples of hewn stone and lime, and left as architectual remains huge monuments and stupendous tumuli; nations well skilled in the working of metals, and whose jewellers rivalled the Venetian gold-workers of the period; nations that spun and wove delicate textile fabrics, and produced mosaic feather-work that was the marvel of the civilized world; nations that were governed by august potentates, and whose kings and emperors were surrounded with a pomp and courtly etiquette as great as that of any European prince; nations with a palpably progressive civilization, with civil and religious polities of no mean order, and whose institutions often resembled those of the Old World."

The native races of Mexico are equally well adapted to Republican institutions, and have since the establishment of its Independence in 1821 supplied several of the most liberal, patriotic, and accomplished statesmen of that country.

II.

# MINERAL WEALTH.

## Silver and Gold.

THE precious metals were produced in Mexico for several centuries prior to the conquest by Cortez in 1521 and the discovery of America by Columbus in 1492. Even before the advent of the Aztecs silver and gold were extensively used in the fine arts by their predecessors, the Toltecs.

Mexico, or such portions of it as were occupied by the civilized nations of the native races, was, from about 600 A. D. to the Spanish invasion, successively ruled by the Toltecs, the Chichimecs, and the Aztecs,[1] the Toltec supremacy being the longest.

Prescott, the historian, says of the Toltecs, they "were the true fountains of the civilization which distinguished this part of the continent in later times."[2] Humboldt says of the tenth century, under Toltec rule, that "Mexico was in a more advanced state of civilization than Denmark, Sweden, and Russia."[3]

These native races may have preserved records of the workings of the mines, for they were well advanced in learning, as in wealth and luxuries. The Spanish found, at the Aztec capital, a large collection of histories and public documents, which they consigned to the flames; and, for aught we know, they may have contained much information in regard to the precious metals.

Here and there in the history of the native races we find detached allusions to their treasures and the working of the mines, and their unrivalled skill as goldsmiths. Indeed, so great was their skill as artists in the working of precious metals that the proud and usually illiberal conquerors were compelled to admit the Aztec superiority in this respect.[4] How great were their products of silver and gold from the seventh century, the beginning of their authentic history, down to 1521, a period of about nine hundred years, we can only conjecture; but history has preserved sufficient data about the splendors of that early civilization to

[1] "Native Races of the Pacific States," by H. H. Bancroft, V, 158.

[2] Prescott's Conquest of Mexico, I, 12.

[3] Humboldt, "Researches in America," 83.

[4] Prescott's "Conquest of Mexico," I, 140.

prove that the sum total of products of the mines must have been exceedingly large.

The only guide for an estimate of the amount produced is the record of the immense treasures found at the Aztec capital by the Spanish conquerors and the natural inferences to be drawn therefrom.

*Treasures of the Toltecs and Aztecs.*—The historian of the "Native Races of the Pacific States" says on this point: "If the ancient traditions may be believed, the Toltec monarchs built as magnificent palaces as their Aztec successors. The sacred palace of that mysterious Toltec priest-king, Quetzalcoatl, had four principal halls facing the four cardinal points. That on the east was called the Hall of Gold, because its halls were ornamented with plates of that metal delicately chased and finished; * * * the hall facing the south was decorated with plates of silver and with brilliant-colored sea-shells, which were fitted together with great skill."[1] The Italian historian of Mexico says: "The Toltecs were the most celebrated people of Anahuac for their superior civilization and skill in the arts; whence, in after ages, it has been common to distinguish the most remarkable artists, in an honorable manner, by the appellation of Toltecas. * * * They had the art of casting gold and silver, and melting them in whatever forms they pleased."[2] More testimony might be given showing the Toltecs were very proficient in the arts, and had advanced to a high degree of civilization and splendor, but it is too general in its nature to assist in forming an estimate of their supply of the precious metals.

The Spanish and other historians have left us fuller accounts of the treasures of the Aztecs. Bernal Diaz, who was one of Cortez's soldiers in the invasion of Mexico, kept memoranda of events, and in after years, when he had returned to Spain, used them as a basis for a history of that remarkable conquest. His writings contain frequent allusions to the presents from the Aztec king. The first mention is of one sent by Montezuma to the Spanish camp, before they had advanced toward the capital, or Tenochtitlon, as it was then called. He says, after describing the speech of the official who brought the presents, "he then brought forth, out of a species of box, a quantity of gold trinkets of beautiful and skilful workmanship."[3]

Again, he tells of an embassy sent from Montezuma to meet Cortez,

[1] Bancroft's "Native Races," II, 173.

[2] "History of Mexico," by F. S. Clavigero, I, 114.

[3] "The Memoirs of the Conquistador Bernal Diaz," I, 88.

who had then started on his march for the capital. The ambassadors were accompanied by an hundred Indian porters well laden with presents of various kinds: "The first was a round plate, about the size of a wagon wheel, representing the sun, the whole of the finest gold, and of the most beautiful workmanship, a most extraordinary work of art, which, according to the account of those who weighed it, was worth above twenty thousand gold pesos. The second was a round plate, even larger than the former, of massive silver, representing the moon, with rays and other figures on it, being of great value. The third was the casque, completely filled with pure grains of gold, as they are found in the mines, worth about three thousand pesos, which was more to us than if it had been ten times the value, as we now knew for certain there were rich gold mines in the country. Among other things there were also thirty golden ducks, exactly resembling the living bird, and of splendid workmanship; further figures resembling lions, tigers, dogs, and apes; likewise ten chains, with lockets, all of gold, and of the most costly workmanship."[1]

Diaz tells of another embassy, with a message from Montezuma to Cortez, while at the city of Tlascalla, which "was accompanied by a valuable present in gold trinkets, of various workmanship, worth about one thousand pesos."[2] Another, which met Cortez at some place on the march toward Mexico, with "presents consisting of gold trinkets, of various workmanship, worth about ten thousand pesos."[3] He tells of another embassy from Montezuma which was accompanied, as usual, with "a present in gold trinkets, of various workmanship, worth altogether above two thousand pesos."[4] Again, of an embassy which brought "presents in gold and cotton stuffs."[5]

All of these presents sent to Cortez were before his first visit to the capital and Montezuma's palace. In Diaz's description of the first peaceful entry of the Spanish troops, and the very hospitable reception by the Aztec king, he says that when Montezuma conducted Cortez to a room in the palace he "hung about his neck a chaste necklace of gold, most curiously worked with figures all representing crabs."[6]

But the bounteous hospitality shown to the Spaniards did not satisfy their greed for gold, and soon Montezuma was detained by them as a prisoner. They used the arts of diplomacy to accomplish their ends, and Cortez succeeded in persuading Montezuma to collect large quantities of treasures to send to the king of Spain. It seems that prior to

[1] Ditto, I, pp. 90 and 91. [2] Ditto, p. 170. [3] Ditto, p. 190.
[4] Ditto, p. 210. [5] Ditto, p. 216. [6] Ditto, p. 223.

this event the Spanish, while in possession of the Aztec palace, had discovered a secret chamber or storehouse of treasures in gold and silver. This discovery they withheld from Montezuma. Diaz tells how Montezuma sent to the officials of the various provinces of his empire for gold to help fill out the proposed present; how he added to the collection the treasures of the secret chamber; that "when the articles were set apart in three heaps and weighed, the silver and other precious things was found to be worth above 600,000 pesos. In this are not included the gold plates, bars, and gold-dust contributed by the other provinces."[1] The reader will observe that values are given for only a small portion of these presents, but the total of those which have values attached is 636,000 pesos, or $7,422,120.[2] How much that would be increased if the value of the other treasures was stated is a matter for conjecture.

All of these acquisitions of treasure by the Spaniards were prior to the sanguinary battles which led to the downfall of the Aztec empire. Soon after the last-mentioned present they became alarmed at the conduct of the natives, and made a precipitous retreat from the city. While fleeing across the causeway over the lake they were fiercely attacked, and, according to Prescott, lost in the lake "chests of solid ingots" of their spoils.[3] After describing their return and attack upon the city, and its final capture, Prescott tells how the Spanish were bitterly disappointed in the amount of booty found; how they believed the Aztecs had buried or hidden the larger portion of the valuables; how they tortured Guatomozin, one of the Aztec officials, to tell where the treasure was secreted, and how he replied "that much gold had been thrown into the water;"[4] how they searched in a pond in the garden of this prince, and found "a sun, as it is called, probably one of the Aztec calendar wheels, made of pure gold, of great size and thickness."[5] Prescott evidently inclines to the opinion that the Spanish were right in their suspicions, and that the Aztecs had delighted in defeating the greed of the conquerors by secreting much treasure.

*The Working of the Mines by the Toltecs and Aztecs.*—But where did this great mass of gold and silver come from? That question excited the curiosity of the Spaniards, and they took early steps to trace the

[1] Ditto, pp. 277–279.

[2] The value of *pesos* is, according to Prescott, eleven dollars and sixty-seven cents. He says that Diaz always means *pesos de oro*, which is different from *pesos*, or the Spanish dollar.—PRESCOTT, I, 320, 321.

[3] Prescott, II, 366. [4] Ditto, III, 234. [5] Ditto, p. 235.

localities of the mines. Diaz says that soon after Montezuma was made a prisoner Cortez asked him where the mines were, and on the strength of the information received in reply sent out three expeditions to discover them; that one of the three brought back three hundred pesos of gold-dust, and reported that "the caziques of the province employed numbers of the inhabitants at the rivers to wash gold out of the sand in small troughs." He says of the second expedition that it did not "return with empty hands;" and of the third, under Pizarro, that it brought back gold-dust of the value of one thousand pesos; that Pizarro reported a visit to the Chinantec caziques, "who ordered a number of the inhabitants to repair to the river, to wash the gold-dust from the sand. The gold-dust here found is of a curly shape, and the inhabitants said the mines where the metal was found in that shape were much more productive, and the metal more solid."[1]

Prescott says of working of the veins of silver and other metals, "in the solid rock into which they opened extensive galleries," that "the traces of their labors furnished the best indications for the early Spanish miners;" that "gold found on the surface or gleaned from the beds of rivers was cast into bars, or, in the form of dust, made part of the regular tribute of the southern provinces of the empire."[2]

Lastly, Baron Humboldt, who had studied the resources of New Spain more closely than any other writer, said: "Long before the arrival of the Spaniards the nations of Mexico, as well as those of Peru, were acquainted with the use of several metals. They did not content themselves with those which were found in their native state on the surface of the earth, and particularly in the beds of rivers and the ravines formed by the torrents; they applied themselves to subterraneous operations in the working of veins; they cut galleries and dug pits of communication and ventilation, and they had instruments adapted for cutting the rock."[3]

Such is the array of testimony of the historians. It proves that the civilized native races worked the mines in an extensive and scientific manner; that they possessed enormous quantities of treasure, and that as artists in the working of gold and silver they were more skilful than the goldsmiths of Europe. Adding to this evidence the fact that the Aztec nation was very numerous, that their cities were many and large, their architecture costly and magnificent, and their living luxurious, it

[1] Diaz's "Memoirs," I, 272-276.
[2] Prescott's "Conquest," I, 138, 139.
[3] Humboldt's "New Spain," III, 109.

is apparent that the sum total of their products of silver and gold must have been very large. But it is impossible to affix a definite value. Only by a comparison of their products with those since the conquest can an estimate of the value be obtained, and that must be an unsatisfactory one.

It may not seem unreasonable to suppose that the total products of gold and silver in Mexico, under the civilization of the native races, for a period of nine hundred and twenty-one years, was equal to one-fifth of the total products during the three hundred and sixty-three years since the Conquest.

What, then, have the mines yielded since the Spanish invasion?

*Products from* 1521 *to* 1804.[1]—For the statistics of this period Baron Humboldt is the standard authority, and his estimates have been accepted as correct by nearly every historian and statistician. His great reputation as a scientist procured for him unusual privileges from the king of Spain, who allowed him the freedom of the Spanish colonial possessions in America for the purposes of his explorations and report. How well he improved the opportunity is shown by the completeness of the report on the resources of Mexico. In compiling his statistics he made use of the official registry of coinage for the period 1690–1804. But for the period 1521–1690 he based his calculations partly upon official records and partly upon estimates of his own, for the registry was incomplete prior to 1690.

The amount of coinage of gold and silver of New Spain, (Mexico and New Spain then being interconvertible terms,) as stated by him, is as follows:[2]

| | |
|---|---|
| 1521–1548 | $40,500,000 |
| 1548–1690 | 374,000,000 |
| 1690–1804 | 1,353,452,000 |
| Total coinage | $1,767,952,000 |

To this he adds one-seventh, or, in round numbers, $260,000,000, for that portion of the products of the mines which, for various reasons,

[1] This period is to, but not inclusive of, 1804. Whenever a period is mentioned in this chapter the estimates are inclusive of the first year, but not inclusive of the last. The reader, if he has occasion to compare any of these estimates with those of the authorities from which they are taken, may occasionally meet with an apparent mistake; but on examination he will find the discrepancy owing to the fact that the figures of the original source are inclusive of the last year.

[2] Humboldt, III, 413, 420.

failed to pass through the mints, making the total products of gold and silver for the whole period, ending at the beginning of 1804, $2,027,952,000.

Of this total the separate products were, according to the authority of Danson, as follows:[1]

| | |
|---|---|
| Silver | $1,948,952,000 |
| Gold | 79,000,000 |

*Products from* 1804 *to* 1848.—For the products of silver and gold of Mexico for the period 1804–1848 (this period, also, being prior to the cessions of territory to the United States) the statistics of Danson, read before the Statistical Society of London in 1850, are very elaborate, and sufficiently cautious to be inside rather than outside the true amount.

They are so well substantiated by explanations and reasoning that we will adopt them in preference to the estimates of any other authority.[2] He based his calculations for the period 1804–1847 upon the returns of the British consuls and the work in Spanish of M. St. Clair Duport. For the year 1847 he took an average of the products of the five preceding years. It will be observed that Danson includes the year 1848, and that the following statistics differ from his because of the omission of that year, and it is better to include 1848 in the next period, as it is the beginning of the yield of gold in California.

The registered product of gold for the period 1804–1848 is $31,038,815. And the registered product of silver is $548,334,598. Danson estimates the registered product of gold as three-eighths of the whole gold product, and the registered product of silver as four-fifths of the whole silver product. We have, then, as the total product of gold of Mexico for the period 1804–1848, $82,770,173; the total product of silver, $685,418,247, and the total product of both metals, $768,188,420.

*Products from* 1848 *to* 1884.—Phillips, an English authority, whose estimates of the production of the precious metals are much quoted, said of Mexico in 1867: "Since 1850, however, the mines of Mexico have regained their ancient prosperity, and their present annual produce cannot be much less than $26,000,000 in silver and $3,200,000 in gold."[3]

In April, 1883, the Minister of Hacienda at the city of Mexico, in response to a communication from U. S. Minister Morgan, asking for

[1] Journal of Statistical Society of London, 1851, page 19.

[2] Journal of Statistical Society of London, XIV, 26, 27.

[3] "The Mining and Metallurgy of Gold and Silver," by J. A. Phillips, pp. 269–270.

information about the coinage, consumption, production, &c., of the precious metals of that country, estimated the annual production at $30,174,021. This, as will be observed, is somewhat larger than the estimate of Phillips given in 1867.

For the whole period 1848 to January 1st, 1884, we will, however, adopt the estimate of average annual production given by Phillips. The result is as follows:

| | | |
|---|---|---|
| 1848 to 1884.— | Silver..... | $936,000,000 |
| " " " | Gold..... | 115,200,000 |
| " " " | Both metals..... | $1,051,200,000 |

*Summary of Products.*—Adding together the products of the different periods as above stated, we have the following sum total of products of silver and gold of Mexico from the date of the conquest by Cortez in 1521 to the beginning of 1884, a period of 363 years:

| *Periods.* | *Silver.* | *Gold.* | *Total.* |
|---|---|---|---|
| 1521–1804..... | $1,948,952,000 | $79,000,000 | $2,027,952,000 |
| 1804–1848..... | 685,418,247 | 82,770,173 | 768,188,420 |
| 1848–1884..... | 936,000,000 | 115,200,000 | 1,051,200,000 |
| 1521–1884..... | $3,570,370,247 | $276,970,173 | $3,847,340,420 |

| | |
|---|---|
| Percentage of silver ..... | 93 |
| Percentage of gold ..... | 7 |
| Average annual production of both metals.... | $10,598,733 |

To test the accuracy of the above estimates we will now give another estimate on a different plan.

The Minister of Public Works of Mexico in his official report for 1881 stated the total coinage of gold and silver in Mexico from the time of the establishment of the mint in 1537 to 1880 as follows:

| | |
|---|---|
| Colonial period, 1521–1821..... | $2,155,038,124 |
| Period of Independence, 1822–1880..... | 950,072,095 |
| Total..... | $3,105,110,219 |

Estimating the annual coinage during the last three years at $25,000,000 per annum, the sum total of coinage of gold and silver in the mints of Mexico to the beginning of 1884 is $3,180,110,219. But coinage and products in Mexico are not interconvertible terms. A large percentage of the products does not for various reasons reach the mints. Minister Romero, when Secretary of the Treasury of that country in 1879, in an elaborate statistical review of the condition of Mexico said: "The production of silver in Mexico undoubtedly exceeds the amount of that metal coined in the mints because no insignificant part of the silver was exported in bars or in objects of arts, such as plates and others, and another part, also considerable, was devoted to the manufacturing of adornments for churches and for use in the houses of the well-to-do families. It can be considered, without the least exaggeration, that the total amount of silver produced represents 15 to 20 per cent. more than was coined."

Adding then one-fifth to the total coinage we have as the sum total of products $3,816,132,262, which is substantially the same as the estimate on the first plan as above given. The very slight difference may be accounted for by the fact that the statistics of *products* which we have taken from the writings of Baron Humboldt commence with the year 1521, whereas the record of *coinage* does not commence until 1537, a difference of 16 years.

But the above summary is incomplete in that it does not include the products by the Toltecs and Aztecs from the beginning of the seventh century to the conquest by Cortez in 1521, a period of nearly a thousand years, in which the civilization of those native races became well advanced in the fine arts and in other respects, as is evidenced by the facts we have above stated from authentic history.

It may not be unreasonable to suppose that the mines of Mexico during the 921 years prior to the conquest by Cortez yielded one-fifth the sum produced during the 363 years since the conquest.

On this theory the sum total of Mexico's products in silver and gold is as follows:

| | |
|---|---|
| Under rule of the Toltecs and Aztecs from year 600 to 1521 | $769,468,084 |
| Under Spanish rule and independence of Mexico from 1521 to 1884 | 3,847,340,420 |
| Total | $4,616,808,504 |

*Products by States.*—The relative rank of the States in production of silver and gold varies somewhat from year to year, but their respective

contributions to the mints for the single fiscal year 1880–1881 will give a substantially correct idea of their present annual rank.[1]

| | | |
|---|---|---|
| 1. | Zacatecas | $5,629,872 22 |
| 2. | Hidalgo | 4,402,382 10 |
| 3. | Guanajuato | 3,998,645 77 |
| 4. | S. Luis Potosi | 2,303,458 46 |
| 5. | Chihuahua | 1,995,206 47 |
| 6. | Durango | 1,453,704 04 |
| 7. | Jalisco | 1,346,653 55 |
| 8. | Sonora | 1,065,053 34 |
| 9. | Sinaloa | 526,136 75 |
| 10. | Mexico | 357,726 35 |
| 11. | Michoacan | 292,262 45 |
| 12. | Oaxaca | 163,591 02 |
| 13. | Guerrero | 103,483 61 |
| 14. | Puebla | 45,126 32 |
| 15. | Coahuila | 32,491 51 |

*Progress of Mining.*—It may be interesting to glance for a moment at the progress of the mining industry in Mexico. The record of coinage being arranged in shorter periods than we have given in the tables of products will, therefore, be the more useful for this purpose, bearing in mind that about one-fifth should be added to change the statistics of coinage to those of products. From 1548 to 1848, a period of three hundred years, the statistics compiled from the writings of Humboldt, Ward, and Blake are as follows:[2]

| *Years.* | *Amount of Coinage.* | *Average Annual Coinage.* |
|---|---|---|
| 1548–1690 | $374,000,000 | $2,643,408 |
| 1690–1700 | 43,871,335 | 4,387,133 |
| 1700–1710 | 51,731,034 | 5,173,103 |
| 1710–1720 | 65,747,027 | 6,574,702 |
| 1720–1730 | 84,153,223 | 8,415,322 |
| 1730–1740 | 90,529,730 | 9,052,973 |
| 1740–1750 | 111,855,040 | 11,185,504 |
| 1750–1760 | 125,750,094 | 12,575,009 |
| 1760–1770 | 112,828,860 | 11,282,886 |
| 1770–1780 | 165,181,729 | 16,518,172 |
| 1780–1790 | 193,504,554 | 19,350,455 |
| 1790–1800 | 231,080,214 | 23,108,021 |
| 1800–1810 | 226,285,711 | 22,628,571 |
| 1810–1825 | 124,560,386 | 8,304,025 |
| 1825–1848 | 284,499,853 | 12,369,558 |

[1] From manuscript "Description of Mexico," by Antonio Garcia Cubas.

[2] Humboldt's "New Spain," III, 294 and 413–420. "Mexico in 1827," by H. G. Ward, I, 286. "Production of the Precious Metals," by Blake, p. 316.

It will be observed that from the Conquest in the year 1521, down to 1810, when the native Mexican priest, Hidalgo, attempted a revolution against the rule of the Spanish, the development of the mines was a steady and continuous growth, with but one or two slight exceptions; that during the last decade of the last century, and the first decade of the present century, the mining industry had reached a high degree of development. This was just prior to the attempt in 1810 by Hidalgo and others to establish the independence of Mexico.

Ward attributes the steady increase of the product of the mines up to 1810 to the influence of the liberal laws and regulations in regard to mining prescribed by the Spanish authorities; but mark the falling-off for the fifteen years following this period, including the attempted revolution by Hidalgo and the successful revolution of 1821, under the lead of Iturbide, also a native Mexican. He says of this period: "After the great convulsions of 1810, 1811, and 1812 nothing remained to denote, amidst the general wreck, the epoch of splendor which had so immediately preceded it."[1]

Since 1848, however, the mining industry has regained its lost prestige, the annual products of silver and gold being, as above stated, about $29,200,000.

*Future products.*—The record of the past is not a guide for estimating the future possibilities and probabilities of mining in Mexico, for it must be remembered that heretofore Mexico has not, like other nations, been blessed with transportation facilities. It has almost no navigable rivers, and until now it has had almost no railways. Happily, the progressive American railway builders have spread a net-work of transportation lines—part projected and part well under construction—over the whole Republic. Hereafter the workers of the mines can do away with primitive methods, and, through the aid of cheaper transportation, improved machinery, and adequate supplies, labor to better advantage and with greater profit.

At the beginning of the present century, when the mines of Mexico averaged in yield of precious metals about $26,000,000 annually, or nearly as much as in recent years, Baron Humboldt said: "The opinion that New Spain [Mexico and the portion of its area since ceded to the United States] produces only perhaps the third part of the precious metals which it could supply under happier political circumstances, has been long entertained by all the intelligent persons who inhabit the

[1] Ward, I, 400.

principal districts of mines of that country, and is formally announced in a memoir presented by the deputies of the body of miners to the king in 1774, a production drawn up with great wisdom and knowledge of local circumstances."[1]

Not only has nature been very liberal in the mineral endowment of Mexico, but she has stored the vast quantities of silver and gold in accessible places. Humboldt says: "A remarkable advantage for the progress of national industry arises from the height at which nature in New Spain has deposited the precious metals. In Peru the most considerable mines, those of Potosi, Pasco, and Chota, are immensely elevated near the region of perpetual snow.[2]

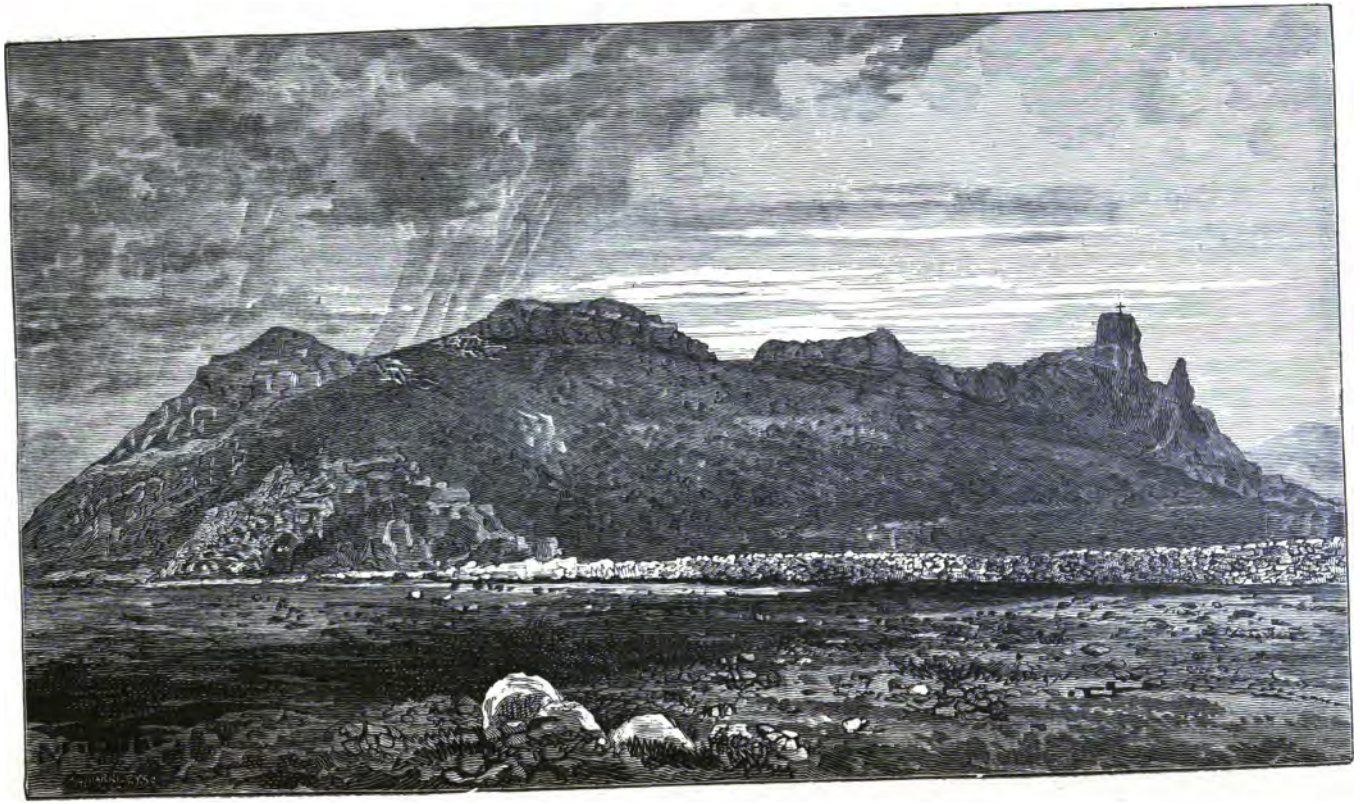
Other testimony to the same effect may be found in the paper read before the Royal Geographical Society of London in 1859 by Charles Sevin, a member of that Society, who visited Mexico to see "how far the mineral wealth of these regions can be worked with English capital." He said: "It is generally known and admitted that the mineral wealth of the country hitherto explored is but a drop in the ocean compared with the virgin mines which exist in every direction, only wanting capital and enterprise for their development."[3]

During the six years ending December 31, 1882, the average annual production of gold and silver in the United States was, in round numbers, $82,000,000, of which the larger portion was yielded by the States acquired from Mexico in 1848 and 1853, viz: California, Nevada, Arizona, New Mexico, Utah, and southern and western Colorado. This is a guide for estimating the future products of Mexico. That country, which now produces but about $30,000,000 each year, can, under the magic touch of American enterprise, and the influence of an adequate development, easily increase its yield of silver and gold to an annual average of at least one hundred million dollars.

## Iron.

The new development of Mexico will require vast quantities of manufactured iron for railways, telegraphs, manufactures, mining machinery, farming implements, and the various and almost limitless requirements of modern civilization. Mexico has not yet fully discarded the wooden plow and other primitive implements, but the time has now arrived

[1] Humboldt's "New Spain," III, 334, 335.
[2] Humboldt's "New Spain, vol. I, pp. 70, 71.
[3] Jour. of Royal Geog. Soc. for 1860, p. 52.



IRON MOUNTAIN OF DURANGO.

when a transformation in this respect is imperative. Other nations are living in an iron age, and Mexico must enter upon the same era if it aspires to its legitimate rank in material progress. Has nature provided Mexico with the means for attaining this end? We think it has in a very liberal manner, for extensive deposits of iron ore have been discovered in many parts of the Republic. A brief description of one in the State of Durango will illustrate this point.

*Description of Iron Mountain.*—A recent prospectus of the company now in control of this mine contains the following description:

"The Cerro de Mercado, or the Iron Mountain, adjoining the city of Durango, Mexico, is probably the most remarkable single deposit of iron ore in the world. It is a mountain of rich ore which measures (as by survey made in 1857) 3,600 feet in length by 1,100 feet in width, equal to an area of over ninety acres, and is 640 feet high. It has been estimated to contain above its base two hundred million (200,000,000) tons of iron ore of unusual purity, free from phosphorus or sulphur, which works kindly and easily and is converted into steel readily and cheaply."

The report upon this mountain by John Birkinbine, mining engineer and Secretary of the United States Association of Charcoal Iron Workers, contains the following:

"Having heard of this deposit, its enormous size, the solidity and purity of the ore, (some even going so far as to pronounce it a mass of pure metallic iron, or an immense aerolite,) I had prepared myself for disappointment, basing my expectations upon former experiences, where distance lent enchantment to what were reported as most wonderful ore supplies. I am, however, free to say that, after visiting most of the larger iron-ore mines of the United States, I have as yet found nothing to compare, as to quantity 'in sight,' with the Cerro de Mercado, at Durango. I am fully aware what such a statement means, appreciating from personal inspection the immense quantity and great purity of the magnetic ores of the Adirondac and Lake Champlain regions of New York State, the incalculable wealth of magnetic ore stored in the Cornwall deposit in Pennsylvania, the extent of the hematites of Virginia, Alabama, Tennessee, and Kentucky, the large output and superior quality of the specular ores from Missouri, and the enormous shipments of rich iron ores annually made from the upper peninsula of Michigan. Unless the physical and geological indications fail, I have no hesitation in pronouncing the Cerro de Mercado as the most extensive known

single deposit of iron ore on the American continent, or, possibly, in the world."

* * * * * * * *

"The best test of the ore is the metal. The pig iron and bar iron were produced at the Piedra Azul Iron Works, on the Tunal River, Mexico, ore from the Cerro de Mercado only being used. The samples were taken from stock without particular selection, and are at your disposal. The piece of bar iron, which is of the ordinary manufacture, I saw wrought in the smith fire, and detected no sign of 'red shortness.' I then had it bent cold, and it exhibits no indication of being 'cold short.'

"To present the richness of the ore, the following comparison with that from other well-known specular mines is given:

| | *Per cent. iron.* |
|---|---|
| Average of seven large Lake Superior mines | 63.364 |
| Pilot Knob, Missouri, (hard ore) | 64.910 |
| Rio Mine, Island of Elba | 61.810 |
| Cerro de Mercado, Mexico | 63.775" |

A further description of this wonderful mine and an estimate of its value is contained in a geological report by Federico Weidner, a mining engineer, eminent in his profession. He says:

"I made, during the past year, [1877,] many expeditions to the Cerro de Mercado, surveying and examining it in every part and detail, even comparing my notes at different dates, so as to secure an accurate idea of its true nature and state.

"To estimate, in the first place, the immense mass of iron that this hill contains, situated, as it is, about half a league from the city of Durango on the north, let us now take its longitude from east to west, which is about 1,750 varas, [a vara is 32.9 inches,] its width 400 varas, and its elevation about the level of San Antonio, 234 varas, we have, as the mean result, that the bulk of the hill is 60,000,000 of cubic varas; also, as the volume of the mountain and its specific weight is five times greater than that of water, I found, as a second result, that the quantity of metal amounts to 5,000,000,000 of quintals, which, melted, will produce, at the rate of 50 per cent., the quantity of 2,500,000,000 of quintals of metallic iron; and, by selling this at the rate of $5 a quintal, it represents a total value of $12,500,000,000.

"This refers only to the metal visible to the eye upon the surface, but we must believe that the quantity concealed beneath must be much greater than that which we find above, because this is always the case in metallic mines of this class."

## Coal.

*Its Importance.*—About three years ago the *Springfield* (Mass.) *Republican* said editorially:

"The discovery of coal in Mexico lies at the bottom of the success and failure of current railroad enterprises which are endeavoring to annex Mexico to the railroad system of the United States. With coal at hand they may succeed; without it, a period of disastrous liquidation is in store for them."

In an elaborate article entitled "The Railway Invasion of Mexico," by Hon. John Bigelow, published in Harper's Monthly, October, 1882, the writer says: "There is another tax upon railway enterprise in Mexico of which we have seen no note made in any of the numerous programmes to which public attention has been invited. We refer to the scarcity of fuel. There is not a single coal mine yet opened in Mexico; and though it is stated that coal in abundance may be found near the Texan frontier, it remains to be proved by better evidence than mere surface indications that the supposed deposit will prove abundant and suitable for the generation of steam, and if both whether it will pay to mine and bring coal where it is needed."

We fully agree with these writers about the *importance* of coal in Mexico, and respectfully submit some facts about the supply—facts which perhaps were not accessible when their articles were written.

*Deposits in Southern Texas.*—Resting upon the Texan side of the Rio Grande, between Eagle Pass and Laredo, where four international railways are projected into Mexican territory, there is an immense deposit of coal thus described in the *Galveston News* of April 12, 1882:

"Within less than one hundred feet of the Rio Grande, and just twenty miles above Laredo, is graded one section of the Rio Grande and Pecos road, and immediately over the road-bed a coal shute is constructed that is intended to deliver the coal directly into the cars. At this time it is emptied into wagons at the rate of thirty tons per day. Ascending a ladder to a height of thirty feet the top of this shute is reached, and from here a tiny railroad stretches to the mouth of a tunnel entering the towering gray hill to the south at a distance of 200 feet. We noticed at its entrance a seam of coal three feet in thickness, over and underlaid by a stratum of shale and slate of an average thickness above and below of some three or four feet. Entering this tunnel one

hour was spent in exploring the coal seam it has devoloped, and here follows what was seen:

"The main tunnel, which is seven feet high and seven feet wide, has been opened to a distance by actual measurement 650 feet, along which every 30 feet tunnels of the same size have been opened both to the right and left for a distance of 150 feet, many of which have been widened into rooms twenty feet wide, leaving the customary pillars of ten feet to support the roof. At a distance of 300 feet from the mouth an air-shaft is opened from one of these wide tunnels twelve feet square to the top of the hill, 800 feet, which secures a perfect ventilation of the mine. Along the main tunnel its whole distance, 650 feet, as well as to the end of all side tunnels, is laid an iron track upon which the coal cars, drawn by mules, enter the mines and carry out the coal. By actual measurement the thickness of the vein, which, at the opening of the mine, was but three feet, has increased to four feet at the present terminus of the tunnel, and the coal seam, which was slightly mixed with foreign matter at the surface, has continued to improve until the vein at a distance of less than fifty feet from the opening has become a solid mass of cannel coal of the finest quality. The coal is got out by digging away the slate and shale from beneath it, and then blasting it down with powder; pieces weighing a half ton frequently being blown down, which have to be broken up to load on the coal cars. The dip of this vein, as far as worked, averages six inches to the one hundred feet, and the vein runs from northwest to southeast. All indications go to show that the vein is, comparatively speaking, inexhaustible. Its outcroppings along the banks of the Rio Grande demonstrate that the vein is at least twenty miles wide, and throughout the thousands of feet of side tunnels opened in the mines the vein never shows any weak points."

*Deposits in Northern Mexico.*—On the Mexican side of the Rio Grande, directly opposite the deposits just described, and also surrounding the points where the same four international railways enter Mexico, are other extensive deposits of coal, thus described by W. H. Adams, M. E., in an address read before the American Institute of Mining Engineers at its meeting in Washington, February, 1882:

"I doubt if many of our engineers know of the existence of coal fields extending over many hundreds of miles of territory bordering on and lying contiguous to the Rio Grande river in Mexico. Essential as these facts are to those contemplating the starting of industrial works along our frontiers, yet I have not been able to learn of any surveys or exami-

nations being made of these deposits, and I trust the preliminary and unofficial investigations made by myself of late may be found of interest, especially to those of our members whose experience has been with poor fuel, or in districts remote from railway facilities."

* * * * * * * *

"From their nearness to the coal measures, the mountains, (Santa Rosa Mountains,) which are protruded into the plains at this particular point, offer a great novelty in producing vertical veins of coal nearly anthracitic in character, which I have opened to a depth of 240 feet. Coal of a more bituminous nature is found outcropping on the rivers thirty, forty, sixty miles to the eastward, and lignites in many places over a wide extent of country drained by the Rio Grande river. The inference is that the heat which changed the metamorphic rocks drove off the bitumen and that the nearer one approaches the mountain line the better is the product."

* * * * * * * *

"Artesian wells being sunk along the line of the Mexican National Railway about Lampasos invariably show salt water before and after reaching the coal seams, and brackish water is also found in the northern belt-line, while the central portion affords unlimited supplies of pure water from stratified limestone. To the eastward breaks in the horizontal strata disclose sandstone, shales, fuller's-earth, grit-stones, &c., while surface openings at several points along the Sabinas river, above ordinary water level, show veins of coal of good workable thickness and excellent quality. The amount of sulphur contained in the coal is considerable and finely disseminated, but not so great as to require a washing operation.

"Passing farther to the east, openings have been made about Eagle Pass, in a circuit of twenty miles in Mexico, and notably at the mouth of Seco Creek. Surface indications are, however, observable over the plains at numberless points between mountain chain and river. At Eagle Pass the Permian system undoubtedly commences, the gray and green-white sandstone showing itself in the bed of the river, and at several places along the Rio Grande river the opportunities for observation are equally perfect. Here the character of the coal changes, and lower grades of bituminous coal and shales are found in wide veins, but so mixed with clay and grit as to be of little value commercially, so far as yet developed. I cannot believe these beds to be brown coal or lignites, as generally stated, the geological formation being certainly too old for lignite; and although we have examples of good coal in the Tertiary, I know of no evidence of the presence of lignites in the Permian.

"Down the river more recent formations outcrop, and in the neighborhood of San Antonio the true brown coals of woody texture are found. Without a knowledge of the lines of upheaval, which are generally easily traceable, the casual observer would not note that Eagle Pass is, say, 500 feet higher than San Antonio, with all the strata inclining towards the latter, showing the coals of Eagle Pass to belong to an older period.

"The future commercial value of this basin of coal (which underlies one of the richest agricultural districts of Northern Mexico, and adjoins a mineral chain of known large extent and exceptional richness) is yet to be determined. At present my own work is upon the upheaval veins, and being preparatory only, differs in no way from perpendicular vein-work of any character. The coal cokes easily, producing about 60 per cent. in weight of good coke; and while I am not now prepared to give details or analyses, yet the extended underground workings and the new bank of fifty ovens to be erected this spring will furnish, I trust, a practical demonstration, which I shall be pleased to show to travellers."

A further description of this same deposit was given by Mr. G. Spence, civil and mining engineer, (Member of the North of England Inst. of Civil Mining and Mechanical Engineers,) in a letter to Minister Romero under date of February 17, 1883. He says: "First, let me say that in the basin of the Rio Grande river, for about a hundred miles above Laredo, and taking a breadth of country into Mexico of about fifty miles, there are immense beds of coal of the class known as cannel coal from two to three feet thick; also of the ordinary rough bituminous coal about four feet thick. Mines of the former are being worked about twenty miles above Laredo, and of the latter on the Sabinas river, a tributary of the Rio Grande, about seventy miles northwest from Lampazos. These beds of coal are to be found over an immense stretch of country, leaving Laredo and searching down the basin toward Gurerro. Betwixt Laredo and this point the outcrops of four different beds of rough coal are found, one of which is near three feet thick. Then between Gurerro and Mier the outcrops of three other beds of coal are found. Then about two leagues below Mier the outcrop of another bed of coal is found, about three feet thick. These are all of the rough bituminous description. Below this latter point the alluvial deposit is so thick that no satisfactory view of the strata can be obtained. But sufficient is seen to prove that a large deposit of coal exists in the basin of the Rio Grande river."

In the State of Sonora, and near the line of another railway connecting the United States and Mexico, is an extensive deposit of anthracite

coal, thus editorially described by the *Two Republics* under date of June 26, 1881:

"Great fields of anthracite coal have lately been opened in Sonora. They are said to rival the anthracite coals of Pennsylvania in quality, and to extend in one section of Sonora over a surface twenty miles in length and two miles in width. Only two of the veins have been worked so far and they show a width of ten and seven feet respectively, all of the purest anthracite, the upper one forming the slope of a hill, being covered only with a few feet of earth, and underlaid twelve feet distant by the second bed of equal quality. They are developed by drifts in the coal which place at least one million tons in sight. The importance of these coal beds cannot be over-estimated. Parties interested have obtained a grant from the Mexican Government for a railway to the coal fields. As this road will be connected with the Sonora railway and the Southern Pacific, the Pacific Coast, and the Mexican railway system, it will furnish a ready market for this excellent coal. This is one of the many great advantages growing out of the building of railways in that section of the country. Sonora and Arizona are remarkably deficient in fuel, a want which these coal discoveries will supply."

Further testimony in regard to the coal deposits of Sonora and points farther south may be found in the report to the American and Mexican Pacific Railway Co., by General W. G. LeDuc, late U. S. Commissioner of Agriculture, who visited the Pacific coast of Mexico in May and June, 1883, in behalf of said company. He says: "Coal, the great carboniferous formation which is found so abundant in Colorado, Arizona, and New Mexico, extends down the western side of the Sierra Madre Mountains and appears at Barrancas, about 140 miles north of Alamos, and there is worked and used for mining purposes. The Barrancas beds, which have been opened, are 6 to 7 feet thick, overlaid by about 1 foot of fire-clay under superincumbent strata. This coal is called anthracite, but differs from what is commonly known as anthracite, and resembles more nearly Missouri cannel coal; is hard, brittle, breaks with the peculiar conchoidal fracture of cannel coal, and has the lustre without smut, but lacks the weight, and will not light at the application of a match. The coal is used under the boilers by Mr. Graff, and is said to be most excellent fuel. It would meet with very large sale at any port on the Gulf, when it could be cheaply landed. The beds are favorably located for cheap mining, and the coal fields already defined are extensive enough to warrant the building of one or more roads to carry this fuel to market. If it should prove on trial to be suitable for smelting pur-

poses, as I believe it may, because it so closely resembles the so-called anthracite coal found in Gunnison county, southern Colorado, the analysis of which, as reported to me, shows 90 per cent. carbon, there should be no hesitation in building your road directly from Alamos through to these coal fields, unless the same or better quality can be found in a more favorable location. The prospecting miners have no knowledge of coal, do not seek it, and few of them would recognize it if seen. I had specimens of black flint, curiously enough, so very like Barrancas coal that at the distance of a few feet it might be mistaken for it, brought to me at Fuerte. At the Rancho Mesquite, about half way from Fuerte to Sinaloa, is a fine exposure of sandstone which should be carefully examined; no better thing could be done by your company than to have a thorough examination made of the Barrancas formations, and of the country on each side of the probable road to determine as definitely as might be the probability of finding one or more coal fields at some place or places more convenient and less expensive of access than Barrancas. I think there can be little doubt of the existence of coal in various localities along the entire length of the Sierra Madre Mountains. Information obtained at Culiacan induces the hope that coal exists within 35 leagues of that place, and also within about the same distance from Mazatlan south of east. But if your main line is located up the Chinipas, as I think it will be, you will be able to reach the Barrancas fields by building about 100 miles of road, and the demand for coal and the price obtained for it at Mazatlan will warrant the construction of the road for this distance."

*Deposits near City of Mexico.*—In Hidalgo, the State which adjoins the State of Mexico on the north, a large number of coal deposits have been found. As this State is intersected by the projected line of the Mexican Southern Railway, and is to be connected by rail with the City of Mexico, the great railway centre of the Republic, these deposits are most advantageously located. The mines are thus mentioned in the *Mexican Financier*, of August 25, 1883:

"The coal district of Zacualtipan in Hidalgo is attracting considerable attention. Coal has been discovered in 25 points, in nine of which its mining is pronounced practicable. Iron ore is also found in the district. The principal mines are called La Galeana, Nuestra Señora de Guadalupe, La Constancia, La Sorpresa, La Coucha, San Rafael, Santa Cruz, La Trinidad, and Caparosa. The working of the mines of this district is practicable with slight cost, for nothing more than tunnels and slopes

will be necessary for many years. In the Guadalupe and Constancia mines the coal is brought out at a cost of only $1 and $1.25 a ton."

Mr. Spence, the mining engineer, from whom we have above quoted. says of these mines in his letter to Minister Romero of February 17, 1883:

"I ascended the mountain slope to Zacualtipan, in the State of Hidalgo. Here I found coal in considerable quantity. Indeed all around the arroyas, ravines, and mountain slopes of this district the outcrop of coal is to be found. I found one company of men doing a little scratching in the way of working; the coal got was a rough bituminous coal of a very good quality." * * * "The coal thus found at Zacualtipan wasbeing worked in an open cutting like a quarry on the slope of the mountain. It lay in beds of from four to sixteen inches thick, with thin beds of black slate betwixt each layer of coal. But the aggregate thickness of the coal beds amounted to over five feet." * * * "Coal of the same quality and description as found around Zacualtipan is also found at Tecamastillan about ten leagues south of Tulancingo. Travelling from Zacualtipan to Tulcanciago the surface of the country is more uniform—the erupted masses as seen around Zacualtipan become less frequent, and no doubt the stratified measures underneath will be in regular order. Then, as we proceed toward the City of Mexico, by the way of Ometusco, the country is more regular still. To the southwest of Ometusco and between there and the City of Mexico is where, I think, the *great coal field* of your country will be found."

South of the City of Mexico, which is the great railway centre, and also south of the city of Puebla, which is the great manufacturing centre, are other very extensive coal fields, perhaps the most extensive and important of that Republic. They are located in the districts of Acatlan, Matamoros, and Chiantla, in the State of Puebla. They are thus described by General José Revuelta, of the City of Mexico, in a letter to Dr. B. R. Carman, under date of June 30, 1882:

"The extent of the territory over which these coal deposits are found covers an area of some sixty square leagues. From various places in this tract of land I had extracted over three hundred (300) tons, about 200 of which were taken to the City of Mexico and nearly as much to the city of Puebla, with a view of testing its qualities in the different foundries and furnaces of those cities, and in the locomotives plying between them, receiving reports from all sources that tried faithfully the coal from the above region pronouncing it a good combustible, stating that it contained little or no sulphur. I found three kinds of coal—soft

coal, others of a medium hardness, and some dry and very hard. All these classes of coal I have had tested on a large scale with favorable results."

The distance from the city of Puebla to the centre of these coal fields is but about 75 miles.

The construction of a railway tapping these deposits has already been commenced, the concession having been granted Aug. 3, 1881. The line is designated "p" on the railway diagram preceding chapter VIII of this book. After intersecting the mines it continues to Tlaxiaco, in the State of Oaxaca.

*Other Deposits.*—In a pamphlet published by Messrs. J. J. Spalding & Co., of Chicago, there is the following mention of coal in the State of Zacatecas:

"In the State of Zacatecas, about forty miles northwest of the city of Zacatecas, near the line of the Mexican Central Railroad, a very superior quality of coal has been found in large qualities. 'As a coal fuel,' Major B. F. Fly says, 'it is very similar to cannel coal and is very easily converted into coke.' The value of this vast coal deposit cannot be overestimated, considering its excellent coking qualities and its immediate accessibility to the rich mountain of iron at Durango, being within 160 miles of that city, on the line of railroad."

Another extensive deposit has been discovered in the southern portion of Mexico, near the Isthmus of Tehuantepec. It is thus described in the report of the mining engineer: "The deposit of coal is found covering some low hills, and is traceable for a distance of over a league in every direction, the coal being nearly on the surface, as is demonstrated by its being, by shafts sunk, showing two stratas within a depth of nine metres. This deposit is on soil covered by a virgin forest, and by analysis it gives the following results:

| | |
|---|---|
| Volatile and combustible matter | 35 per ct. |
| Fixed carbon | 45 per ct. |
| Moisture | 8 per ct. |
| Ashes (ferruginous) | 12 per ct. |
| | 100 |

Showing it consists of eighty per cent. of combustible matter. This analysis it must be borne in mind refers only to the superficial layers which are in contact with the air and moisture, and it is presumable that the deeper layers will give better results."

The report also mentions that the coal has been tested on steamers with "most satisfactory results."

Coal has also been found in the States of Vera Cruz, Michocacan, Oaxaca, Morelos, Tlaxcala, Jalisco, Tamaulipas, and doubtless in several other States. Until recently there has been but little incentive for the discovery of coal in Mexico, for it has had almost no merchant marine and railways, comparatively few factories to create a demand for this class of fuel, and being almost entirely without navigable rivers, there were consequently but very few steamboats requiring coal. Again, the climate is so mild in the thickly populated portions of the Republic that but little fuel is required for domestic use. But the new railway era which is dawning upon that country, the prospect of the establishment of furnaces, foundries, machine-shops, and many other industries are stimulating a careful search for coal deposits. Evidence of this may be seen in the *Two Republics* of October 12, 1882, which says:

"The city council of Puebla has addressed a memorial to Gen. Pacheco, the Minister of Public Works, requesting that the Executive shall encourage coal mining by premiums and exemption from taxes as well as by promoting railroad building in the regions where coal is said to exist."

Doubtless the deposits above described are but the forerunners of very many more which will soon be unearthed and add their products to the sum total of Mexico's mineral wealth.

## Petroleum and Asphaltum.

In an official report to the State Department in 1868 U. S. Consul Hoyt, at Minititlan, at the Isthmus of Tehuantepec, writes:

"Petroleum is sufficiently abundant in this district to supply the world. Indications of its locality exist everywhere, and in many places it comes to the surface and forms small lakes and springs to such an extent that it can be dipped up in large quantities. In fact, the whole of this side of the Isthmus is a vast lake of petroleum, in my estimation; and from the explorations I have made I believe it can be found almost anywhere. Its richness has been tested by some of the best chemists in the United States. Professor Percy, of New York, has made an analysis of some of this petroleum taken from the surface, (or rather, from one of the springs,) the result being as follows:

| | |
|---|---|
| Volatile combustible matter | 75.95 |
| Coke | 24.05 |
| | 100.00 |

"Submitted to distillation in solid retorts it furnishes a thick lubricating oil of specific gravity of 0.897 (26 degrees Beaumé) in the following proportions: One pound of bitumen yields eight and a half fluid ounces of oil; hence one ton of 2,240 pounds yields 148.75 gallons, or 3.72 barrels of forty gallons each.

"A separate fractional distillation, with the heat raised to 400 degrees Fahrenheit, yielded, in hundred parts:

| | |
|---|---|
| Illuminating oil | 13 |
| Lubricating oil | 87 |
| | 100" |

During the past year a stock company has been organized in Boston to work the petroleum springs in the State of Vera Cruz. The special correspondent of the *Mexican Financier* thus describes them in a letter dated August 1, 1883:

"Those interested in Mexican oil properties may not be aware in how large a field oil is found in the State of Vera Cruz alone. From Papantla to Tampico and from the sea to the mountains, a tract some 150 miles long by 50 wide, known as the Huasteca, is dotted with petroleum springs all over the country, not apparently following any particular surface formation, but as rich by the lagunas on the coast as among the foothills of the great eastern range. At some places, notably at Juan Felipe, two days' ride inland from Tuxpam, the surface deposits of bitumen, or 'Chapopote,' as it is called, are simply astounding, large black fields and long streams having spread out in the course of ages, and being now as hard and smooth as a well-made asphalt pavement, while the little springs are innumerable, the whole ground seeming full of it. These large deposits are the residue caused by the evaporation of the petroleum and other more volatile portions of the tarlike substance which exudes from the ground and, under the tropical sun, it imperceptibly spreads out into the forest until lost under accumulated leaves and earth. There is always a soft place in every deposit where the fresh chapopote comes oozing up, and through which large bubbles, filled with a highly inflammable gas, rise and burst. The oily scum, if skimmed off, burns fiercely, and during rain storms the water is highly irridescent from the oil floating on top. Thus there would seem to be no doubt of the richness of these springs, and the excellence of the oil is shown by that produced at Papantla in a small refinery which has been in operation for some years, where it is produced as clear and white as water, and with a strong kerosene-like smell, giving a strong light."

U. S. Consul-General Strother, under date of January 1, 1883, sent to the State Department a very elaborate report on the subject of Mexican asphaltum, which we herewith reproduce in full, for it is a summary itself and cannot well be abridged. He says:

"A variety of bituminous substances, from the pure hard asphaltum to the fluid naphtha and petroleum, are known to exist in immense quantities along the coast of Mexico, chiefly in the States of Tamaulipas, Vera Cruz, and Tabasco, but up to date I have not been informed that there has ever been any organized effort to utilize these deposits either for domestic purposes or for commerce, although by individual enterprise small and irregular shipments have been made from the ports of Tampico, in Tamaulipas, and Frontera, in Tabasco. Consul A. J. Cassard, of Tampico, says that almost inexhaustible beds of asphaltum exist on both banks of the river Thamesi, about 60 miles above that port, being found in a comparatively pure state, and containing only an insignificant percentage of foreign matter, mostly vegetable, which it gathers while oozing through the sedgy borders of the river. It may be gathered with little difficulty; but as the locality is only accessible to boats of light draught, the transportation is the principal hindrance to its exploitation on a large scale. In exporting the article considerable expense may be avoided by transferring it directly from the boats in which it is originally loaded to vessels not drawing more than 7½ feet of water, which can safely pass the Tampico bar. In this way asphaltum may be exported here at a cost of from $8 to $10 a ton of 2,000 pounds. Clearance fees on such shipments are $5, and commission 2½ per cent. These expenses are on shipments in bulk. Packing increases its cost very heavily. Mr. G. Claussen is the only regular exporter of asphaltum in Tampico.

"Asphaltum, or 'chapopote,' as it is popularly called in Mexico, is frequently found floating in masses on the rivers and lagoons, and is cast up on the beach by the waves all along the Gulf coast, especially in the vicinity of Tuxpan and about the Grijalva river in Tabasco, which masses, by the local law of 'flotsam,' are the property of the finder, and are sold at the rate of from 50 cents to 62½ cents per arroba, 25 pounds. Small lots are occasionally shipped from Frontera to New York and elsewhere. I do not hear of any regular exporters of the article here or elsewhere, except in Tampico, as before stated, although recently published Mexican consular reports show that small quantities of 'chapopote,' hard, clean, and brilliant in quality, are sold in the Hamburg market at from $3.60 to $3.80 per hundred-weight.

"In the State of Vera Cruz this substance is found in greater or less abundance in the following localities:

"*Canton of Jalacingo.*—On the lands of Señor Camilo Vega, in the municipality of Tlapacoyan.

"*Canton of Minatitlan.*—In many different localities, most notably in a place called Chapopote, near Tonalapa.

"*Canton of Ozuluama.*—Several deposits of petroleum, asphaltum, and stone-coal are known to exist in a place called El Chapopotito, in the municipality of Panuco; also at Chapopote, in the same municipality.

"*Canton of Papantla.*—There is a deposit of asphaltum at Tupani, in the municipality of Papantla; others are found on the lands of the hacienda of San Pedro, opposite the junction of the Tehuantepec and Apulcos rivers, from the Armadillo Pass to the Mirada mountain.

"*Canton of Tuxpan.*—Large deposits exist in the hacienda of Chapopote; also in the creek and mountain of that name.

"*Canton of Tomtoyuca.*—There is a spring of asphaltum in the hill of Tamelul, in the municipality of Tempoal.

"In brief, the whole coast region of the State of Vera Cruz is rich in asphaltum and kindred bituminous substances, such as naphtha, petroleum, and stone-coal.

"In the State of Vera Cruz, near the village of Moloacan, a few leagues distant from the navigable river of Coatzacoalcos, there is an immense deposit of asphaltum, which in some points is found pure, and in others more or less mingled with rock-salt and saltpetre. It was visited in 1844 by a learned German traveller, Dr. Hechler, who thus describes it:

"'The deposit to which I refer is not more than a league in a direct line from Moloacan, although by the winding road the distance is over three leagues. The 'salt mine,' as it is popularly called here, is an isolated spur branching off from the main ridge or cordillera. This mountain is from 1,000 to 1,200 feet in height, and with a base of from 3½ to 4 miles in extent, shaped conically, and cracked by earthquakes; on its slopes are found a number of pits, some cold and still, others seething and bubbling with noise and a stifling odor. These pits would appear to have cavernous connection with the internal fires of the mountain, which, as indicated by the external heat and frequent subterranean noises, doubtless contains vast masses of material in a state of combustion. The whole adjacent surface consists of asphaltum partly solid and partly liquid, and more or less mixed with rock-salt. So extensive are these beds that the supply may be considered inexhaustible. In some

places the seething pits still continue to eject masses of asphaltum in a liquid state. The Indians call it Chapopote. It may be that this mountain will one day sink and its site be occupied by a lake of asphaltum, like the historic Dead Sea of the Holy Land.'

"I have also authentic information of extensive beds of asphaltum in the State of Chiapas, on the upper waters of the Grijalva river, which has its course through the State of Tabasco, and empties into the Mexican Gulf, near Frontera. As far as I can ascertain, neither asphaltum nor any of its kindred substances are found in any of the central and mountainous States of the Republic, nor in any of those bordering on the Pacific Ocean, and where there has been a special demand for such material on the western coast it has been imported from San Francisco. The foregoing information has been derived from correspondence with our consular officers, from conversation with individuals, and principally from the records of the Mexican Society of Geography and Statistics in this city. While it is for the most part rather general and meager in details, it may be considered as sufficiently authentic and satisfactory in regard to the existence of extensive deposits of the material in question in the localities indicated."

## Other Mineral Wealth.

In addition to the more important minerals above described, many others, such as copper, quicksilver, lead, antimony, sulphur, tin, salt, &c., &c., are found in that prolific country. Space does not permit an extended review of all, nor are the facts about the extent of some of these deposits sufficiently known or accessible to justify the attempt. We will, however, briefly mention a few.

*Copper.*—The United States consular reports from Sonora frequently mention the existence of copper. One report dated October 1, 1876, says copper and lead are found in abundance. The *Chihuahua Enterprise* of August 15, 1883, contains the following:

"The development of the great copper belt on the west coast of Mexico, which is over 600 miles in length and from 30 to 100 miles in width, will and must bring about a great change in the price of copper, not only here, but also in Europe."

Wm. M. Gabb, of the State geological survey of California, who in 1867 went with an expedition to Lower California, says:

"Copper stains and little streaks of this metal exist in almost innumerable localities through the peninsula, both in the metamorphosed

mesa sandstones and in the granite. The principal localities where any work has been done are at the Calabazas, between Triunfo and La Paz; at the Sauce, near Lareto; Larroque's mine, near the mouth of the Arroyo del Paraiso; at the northern San Antonio, and at the Delphina mine at La Salada."[1]

The total coinage of copper in Mexico from the date of the establishment of the mint in 1537 to the year 1857 was $5,737,730.[2]

*Sulphur.*—The *Mexican Financier* of November 10, 1883, contains the following interesting item on this subject:

"It is said that the recent excursion to Popocatepetl had for its object the looking-over the ground for the mammoth works projected to facilitate the mining of the sulphur from the crater. It is proposed to drive a tunnel into the crater of the volcano and to build from the mouth of the tunnel a railway to connect with the Interoceanic railway at Amecameca. The parties who are in negotiation for the property with the owner of the volcano, General Gaspar Sanchez Ochoa, are said to be a rich American house. The representative of the house visited the volcano with the French engineer, Mr. Charles Roay. A contract is said to have been made for the exportation of 50,000 tons of sulphur a year, at least. It is also proposed to establish a factory of sulphuric acid for use here in Mexico, selling it at $3 a quintal of 65 degrees strength."

*Antimony.*—United States Consul Willard, in a report from Sonora dated December 31, 1881, says:

"A valuable deposit of antimony ore was discovered in the Altar district, and the company working the same has made several shipments of the ore, amounting in all to 400 tons, more or less, to San Francisco, from Salinas, near port of Libertad, on the Gulf, and about 200 miles north of Guaymas. Several other deposits of antimony have also been discovered."

*Quicksilver.*—Under date of February 10, 1882, Mr. Strother, United States consul-general at the City of Mexico, sent to the State Department the following notes, which he says "are approximately correct, and comprise all the information obtainable hitherto on the subject:"

"The annual product of quicksilver in the Republic of Mexico amounts to about 6,000 flasks of 75 pounds each.

"The principal points of production are La Luz, in the district of

[1] Resources of the Pacific Slope, by J. Ross Browne, p. 120 of Appendix.

[2] Report of Sec'y of Finance of Mexico of the 15th of January, 1879, p. 179.

Huitzuce, State of Guerrero; Gambella, in the same district; and Guadalcazar, in the State of San Luis Potosi.

"This product might be increased indefinitely under the stimulus of higher prices, but at present is supposed to be declining, as it cannot profitably compete in price with that imported from the United States.

"The average cost of imported quicksilver is about $56 per flask—the price, however, subject to fluctuations depending on supply and rates of exchange. The cost of production in Mexico is not accurately known, but the native product yields no profit at the average price above stated.

"The 'patio' system, or the beneficiating of the precious metals by amalgamation, is almost universal in Mexico, and nearly all the quicksilver produced and imported is used for this purpose.

"The aggregate amount consumed annually is estimated at about 14,000 flasks of 75 pounds.

"About 7,000 flasks are imported annually from San Francisco, through the ports of Mazatlan and Manzanillo, on the Pacific, for consumption in the mineral districts of Durango, San Luis Potosi, Zacatecas, and Guanajuato.

"The annual imports from Spain and England are about 3,000 flasks, of which about 2,000 go to Real del Monte, in the State of Hidalgo, while the remaining 1,000 is consumed by minor enterprises or held for speculation.

"Of late years importations have been increasing, and have been in excess of demand.

"The recent commercial revival in Mexico has not as yet had any perceptible influence on the mining industry, nor has it in any way affected the quicksilver market."

Mr. Strother adds:

"As an amendment to the foregoing, I can add that from information derived from the director of the mint in this city, the amount of quicksilver on hand in this country January 1, 1882, may be approximately estimated at 5,000 flasks."

About a year ago, in February, 1883, a National Mining Society was organized in Mexico, one object of which, it is reported, is to collect data about the mineral deposits of that country and to attract foreign capital to their development. It is to be hoped this information will soon be accessible to the American public, and we regret it is not already accessible for the purposes of this outline review—for the facts and figures above given are necessarily fragmentary and incomplete.

## III.

## AGRICULTURAL WEALTH.

HE who thinks that the mines of Mexico contain the sum total of its natural wealth repeats the error of Daniel Webster in regard to the agricultural capacity of a former province of that country. In 1850 he said in the United States Senate: "I am sure that everybody has become satisfied that although California may have a very great seaboard, and a large city or two, yet that the agricultural products of the whole surface now are not, and never will be, equal to one-half part of those of the State of Illinois; no, nor yet a fourth, or perhaps a tenth part."[1]

Yet, with a partial development of its agriculture, the wheat crop of California in 1875 exceeded in value that of Illinois and every other State of the Union; its product of barley was in value four times that of Illinois, and greater than that of every other State; its wool product was in value nearly double that of Illinois, and greater than the yield of every other State except Ohio; its wheat product was more than ten million dollars in excess of its gold product, and in 1876 its wheat crop was in value over twelve million dollars in excess of the wheat crop of Illinois.

Those keen observers of nature—the Aztecs and other civilized native races—selected the table-lands of Mexico as their favorite part of North America for founding an empire. They were entirely dependent upon the resources of their own land for the necessities of life, and could not have maintained for several centuries a civilization celebrated for luxury unless the agricultural capacities were equal to their requirements.

But let us examine a few facts and figures. The record of the last attainable year shows the following great variety of agricultural products. It is from a recently prepared manuscript description of Mexico by Antonio Garcia Cubas, a prominent statistician of that country:

| *Product.* | *Value.* | *Product.* | *Value.* |
|---|---|---|---|
| Indian corn | $112,164,424 | Cotton | $6,605,831 |
| Wheat | 17,436,345 | Oats | 4,403,742 |
| Sugar | 8,761,317 | Red pepper | 4,196,482 |
| Beans | 8,406,211 | Henequen | 3,352,000 |

[1] See Speech on Public Lands, &c., of California, in vol. V of his works, p. 398.

| Product. | Value. | Product. | Value. |
|---|---|---|---|
| Coffee | $2,560,000 | Indigo | $358,002 |
| Tobacco | 2,006,153 | Ixtle | 154,053 |
| Straw | 1,962,879 | Beneseed | 153,643 |
| Rice | 1,248,224 | Sarsaparilla | 149,489 |
| Cocoa | 1,140,050 | Anise seed | 127,268 |
| Vanilla | 651,958 | Lentils | 83,043 |
| Spanish pea | 543,283 | Canary seed | 57,410 |
| Lima beans | 477,610 | Cumin seed | 23,500 |
| Chick pea | 471 075 | | |
| Potatoes | 457,592 | | $177,951,584 |

This list might be greatly extended if the statistics of other products were accessible, particularly those of the tropical and other fruits which are mentioned in the following extract, quoted by the Mexican Minister of Finance from a work by J. B. Legrain, entitled "The Agricultural Situation and Future of Mexico," published in Brussels in 1864.[1]

The author says:

"Probably there exists no other country in the world the configuration of which is so extraordinarily advantageous for agriculture. Mexico possesses every kind of vegetable and fruit tree of Europe. The central table-lands produce, in the greatest abundance, cherries, plums, peaches, apricots, figs, grapes, melons, apples, and pears; and in the hotter districts they produce pineapples, mameyes, cassavas, anonas, and chirimoyas. The orange and lemon are cultivated equally on the central table-lands. The mageuy, a species of the *agave Americana*, which grows well in the elevated regions, gives pulque, a drink which the inhabitants prefer to wine. Almost all the vanilla consumed in Europe comes from the forests in the States of Vera Cruz and Oaxaca; there the sarsaparrilla, which is exported in considerable quantities; Jalapa root is found especially near the city of this name; also superior kinds of tobacco, sugar-cane, and indigo are cultivated there; and it should not be left unmentioned that rice is cultivated in the wet bottoms of the valleys. Lastly, and to conclude this long enumeration, we will add that the forests are full of oak, pine, cypress, ash, walnut, cedar, ebony, campeche wood, mahogany, palms, tamarinds, acacias, and Indian cane.

"The domestic animals of Europe have prospered in Mexico and have multiplied enormously."

[1] Report of the Secretary of Finance in 1879 on the Actual Condition of Mexico, p. 159.

## Wheat and Corn.

In speaking of the table-land in Mexico, extending from Queretaro to Leon, Baron Humboldt said at the beginning of the present century: "The wheat harvest is thirty-five and forty for one, and several great farms can reckon fifty or sixty to one." * * * "At Cholulu the common harvest is from thirty to forty, but it frequently exceeds from seventy to eighty for one. In the valley of Mexico the maize yields two hundred and the wheat eighteen or twenty. I have to observe that the numbers which I here give have all the accuracy which can be desired in so important an object for the knowledge of territorial riches. Being eagerly desirous of knowing the produce of agriculture under the tropics, I procured all the information on the very spots; and I compared together the data which I was furnished by intelligent colonists who inhabited provinces at a distance from one another. I was induced to be so much the more precise in this operation as, from having been born in a country where grain scarcely produces four or five for one, I was naturally more apt than another to be disposed to suspect the exaggerations of agriculturists."[1] Of another part of Mexico he said: "Near Zelaya the agriculturists showed me the enormous difference of produce between the lands artificially watered and those which are not. The former, which receive the water of the Rio Grande, distributed by drains into several pools, yield from forty to fifty for one; while the latter, which do not enjoy the benefit of irrigation, only yield fifteen or twenty."[2] California was then a part of the kingdom of New Spain, and Humboldt includes it in his investigations. He said: "In the northern extremity of the kingdom, on the coast of New California, the produce of wheat is from sixteen to seventeen for one, taking the mean term among the harvests of eighteen villages for two years. I believe that agriculturists will peruse with pleasure the detail of these harvests in a country situated under the same parallel as Algiers, Tunis, and Palestine, between 32° 39′ and 37° 48′ of latitude."[3] After setting forth in detail the wheat-growing capacity of New Spain, he contrasts the statistics with those of other nations, as follows: "We shall collect into one table the knowledge which we have acquired as to the mean produce of the cerealia in the two continents. We are not here adducing examples of an extraordinary fertility observable in a small extent of ground." * * * "But in treating of agriculture in general we speak merely of

[1] Humboldt's "New Spain," II, 413 and 414.
[2] Ditto, p. 415. [3] Ditto, p. 419.

extensive results, of calculations in which the total harvest of a country is considered as the multiple of the quantity of wheat sown. It will be found that this multiple, which may be considered as one of the first elements of the prosperity of nations, varies in the following manner: five to six grains for one in France, according to Lavoisier and Neckar." * * * "This is also the mean produce in the north of Germany, Poland, and, according to M. Rhüs, in Sweden." * * * "Eight to ten grains for one in Hungary, Croatia, and Sclavonia, according to the researches of M. Swartner." * * * "Seventeen grains for one in the northern part of Mexico." * * * "Twenty-four grains for one in the equinoctial region of Mexico."[1]

He says of the quality: "The Mexican wheat is of the very best quality; and it may be compared with the finest Andalusian grain." * * * "In Mexico the grain is very large, very white, and very nutritive, especially in farms where watering is employed."[2]

Ward, the British minister to Mexico, said in 1827: "There are few parts either of the *Tierra Caliente* or of the table-land in which maize is not cultivated with success. In the low hot grounds upon the coast and on the slope of the Cordillera its growth is more colossal than on the table-land; but even there, at seven and eight thousand feet above the level of the sea, its fecundity is such as will hardly be credited in Europe."[3]

A very elaborate and valuable review of this subject by W. W. Nevin, Secretary of the Mexican National Railway, is contained in a recent communication to Mr. Nimmo, Chief of the Bureau of Statistics, through whose courtesy we make use of the following extracts:

"The last decade has seen the tremendous development of California as a grain-growing State, and the magic rise of the Northern Pacific wheat fields.

"Another vast grain field, large enough to affect the supply and consumption of the world, and to enter into serious competition with the United States and Russia—the two leading wheat-exporting countries of the world—now looms into sight. It is Mexico, and it comes to the front as part of the great commercial and industrial reconstruction of that land by the American railways.

"The physical formation of Mexico is simply an extension southward of the Great Colorado Mountain base plateau. Wheat grows on the

[1] Humboldt's "New Spain," II, pp. 427–428. [2] Ditto, p. 434.
[3] Ward's "Mexico in 1827," I, 42.

plateau of Mexico at from 6,000 to 9,000 feet above sea-level, and between the 18th and 24th parallels of latitude. Corn grows everywhere, except on certain waste districts along the northern frontier, where the soil is the same as the alkali plains of Arizona and New Mexico. The wheat-growing area of Mexico, par excellence, extends from, say Puebla nearly to Colima, about 500 miles east and west, and from southern Michoacan to Zacatecas, about 400 miles north and south. This plateau is broken by mountain ranges into a number of rich districts specially adapted to the growing of wheat, namely: the Lerma Valley, roughly 200 by 16 miles; the Bajio, (northern Michoacan, Jalisco, and southern Guanajuato,) 200 by 200 miles; Aguas Calientes, 50 by 50 miles; the San Luis Potosi and Queretaro district, 150 by 30 miles; total, say 52,000 square miles. Of this immense field of rich and arable land one-third, it is believed, could be readily put into wheat with due regard to the other agricultural interests of the country.

"Under the Mexican plan of cultivation three crops are taken off the land every two years—one crop of wheat and two crops of corn. The average yield of wheat of Mexico now does not exceed 20 bushels to the acre. Corn on irrigated lands runs about 50; on dry land about 30 bushels to the acre. The mode of cultivation is similar to that of the Egyptians thousands of years ago. Wooden beam plows are used, with a small iron shoe, which scratches a furrow five inches broad by five deep. Five men are used and five yoke of oxen, where one would be needed in Pennsylvania. Nevertheless, the wheat raised is of the very finest quality.

"At the Centennial Exposition, Philadelphia, 1876, Mexico led the world in wheat, taking the first prize.

"Threshing is done by driving mares around over a circular tile or stone floor, winnowing by men tossing the grain and chaff into the air with scoop shovels, and transportation from the field to the farm-house or railway station is on ponderous two-wheeled ox-carts, in which the ox pulls about three pounds of cart to one pound of load.

"Apart from the 52,000 square miles spoken of above, which is the choice wheat-producing area, there is sufficient outlying wheat, barley, and corn land now under actual cultivation to supply the present population of Mexico, ten millions. These people are at present fed on grain raised just where they live, there having been up to this time no organized machinery for transportation of products from one part of the country to the other. Mexico is substantially a corn-fed nation, seven-eighths or more of the people living habitually on tortillas.

"Were this wheat area cultivated to its full capacity, namely, 17,333⅓ square miles, or one-third of 52,000 square miles, it would yield under present conditions twenty bushels of wheat and forty bushels of corn per acre, as follows: First year, wheat crop, 221,866,660 bushels; first year, corn crop, 433,733,320 bushels; second year, corn crop, 443,733,320 bushels—or say an average of 110,000,000 bushels of wheat and 440,000,000 bushels of corn every year; and this immense yield is all available for a foreign market, as the outlying lands will always raise enough for the home consumption of Mexico, as they now do. This special wheat area we are talking about is less than one-fourteenth of the total area of Mexico.

"But under the modern conditions of agriculture, with improved machinery and systematic feeding of the soil, this yield would be much greater.

"By the end of 1884 Mexico will probably enjoy a reasonably thorough railway system, viz: two trunk lines from the capital to the United States, having also good branch lines to the Gulf ports of Vera Cruz, Tampico, Matamoras, and Corpus Christi. The land of Mexico is largely held in huge estates, often like those of the great land-owners of England. The Bustamente estate, for instance, extends over portions of three States, and the line of the National Railway runs through it for fifty miles. These vast estates, with the fact that in the central part of Mexico at least they are of cleared land, will enable the wheat-growing area to be put rapidly under cultivation when once the railways open up a market for wheat.

"Further, $6 to $10 a month is now rather high pay in Mexico for agricultural labor. Wages will be raised some, of course, under the stimulus of the new industrial era, but common labor in Mexico will for a long time remain very cheap as compared with the United States. The Mexican wheat grower, therefore, enters the market of the world under peculiarly favorable conditions. He owns his own land in large tracts; he works it with the cheapest labor, and he frequently is a man of large funded capital; he is, also, nearly everywhere in his country, nearer the seaboard than are the wheat growers of the United States.

"It may be further added that the above figures are very conservative. Some writers and engineers who have carefully studied Mexico extend the area of this central wheat belt very largely, and place the rate of production per acre higher."

During the last attainable year the States ranked as follows in value of products of corn and wheat:[1]

| | *Corn.* | | *Wheat.* |
|---|---|---|---|
| 1. | Jalisco | $15,811,479 | Jalisco | $4,377,957 |
| 2. | Guanajuato | 10,107,000 | Chihuahua | 2,060,391 |
| 3. | Mexico | 9,235,395 | Guanajuato | 1,983,040 |
| 4. | Oaxaca | 8,802,720 | Puebla | 1,300,000 |
| 5. | Michoacan | 8,630,790 | Zacatecas | 1,200,000 |
| 6. | Puebla | 8,452,680 | Coahuila | 1,143,100 |
| 7. | Vera Cruz | 8,079,360 | Tlaxcala | 940,800 |
| 8. | San Luis Potosi | 6,081,600 | Mexico | 820,490 |
| 9. | Zacatecas | 5,063,560 | San Luis Potosi | 720,000 |
| 10. | Yucatan | 4,646,560 | Michoacan | 569,000 |
| 11. | Hidalgo | 3,456,000 | Oaxaca | 541,820 |
| 12. | Guerrero | 3,063,800 | Durango | 476,400 |
| 13. | Nuevo Leon | 2,338,200 | Queretaro | 325,200 |
| 14. | Durango | 2,268,000 | Sonora | 280,000 |
| 15. | Sinaloa | 2,194,820 | Aguas Calientes | 207,000 |
| 16. | Morelos | 1,885,200 | Sinaloa | 148,000 |
| 17. | Tamaulipas | 1,677,120 | Federal District | 110,100 |
| 18. | Tlaxcalla | 1,602,100 | Tamaulipas | 82,000 |
| 19. | Chihuahua | 1,520,319 | Nuevo Leon | 80,000 |
| 20. | Queretaro | 1,457,000 | Hidalgo | 62,910 |
| 21. | Sonora | 1,399,920 | Ter. of Lower Cal. | 59,337 |
| 22. | Tabasco | 1,121,040 | Vera Cruz | 44,000 |
| 23. | Coahuila | 836,085 | Morelos | 4,800 |
| 24. | Chiapas | 796,000 | Campeche | ..... |
| 25. | Aguas Calientes | 744,166 | Chiapas | ..... |
| 26. | Colima | 650,711 | Colima | ..... |
| 27. | Federal District | 215,750 | Guerrero | ..... |
| 28. | Ter. of Lower Cal. | 22,715 | Tabasco | ..... |
| 29. | Campeche | 4,334 | Yucatan | ..... |
| | | $112,164,424 | | $17,436,345 |

It will be observed by a glance at the above table that corn is produced in all of the total 29 political divisions of that Republic. Wheat is reported from 23 of the total 29 divisions, those, from which none is reported being chiefly lowland States.

Jalisco ranks first in both corn and wheat.

[1] Compiled from Estadistica de la Republica Mexicana, by Emiliano Busto.

## Tobacco.

Baron Humboldt said at the beginning of the present century: "The cultivation of Mexican tobacco might become a branch of agriculture of the very highest importance if the trade in it were free." * * * "At Vera Cruz the quantity of tobacco produced in the districts of Orizaba and Cordova is estimated at eight or ten thousand *tercios*, (at 8 arrobas,) equal to 1,600,000 or 2,000,000 pounds; but this estimate appears to be a great deal too low."

At present Mexico produces tobacco to the value of about $2,000,000 annually.

The relative rank of States in this product is as follows:

| *States.* | *Value of Product.* | *States.* | *Value of Product.* |
|---|---|---|---|
| 1. Vera Cruz | $884,376 | 8. Guerrero | $18,456 |
| 2. Jalisco | 710,000 | 9. Queretaro | 10,900 |
| 3. Yucatan | 229,500 | 10. Michoacan | 8,500 |
| 4. Oaxaca | 48,250 | 11. Chiapas | 2,916 |
| 5. Campeche | 34,670 | 12. Colima | 2,655 |
| 6. Tabasco | 29,080 | | |
| 7. Sinaloa | 26,850 | Total | $2,006,153 |

These twelve, however, are not the only States adapted to the cultivation of tobacco, but simply the States whose products are sufficiently large to be noticed in the official publications of the Government. Doubtless several others will soon be added to the list.

Of the quality of Mexican cigars, General Grant says in a recent letter to Minister Romero:

"I this morning received the Mexican cigars you sent me to try, and acknowledge the receipt of them at once, because I have been smoking the Mexican cigars almost exclusively over two years, and therefore know their quality without further trial. My friends to whom I have sent the cigars pronounced them superior to imported Havanas. I predict that in the future the trade between the United States and European States and Mexico will grow into large proportions, and tobacco of your country will prove an important part of that trade."

## Sugar.

The standard authorities on the resources of Mexico express but one opinion about its capacity for the production of sugar, and that a very complimentary one. Baron Humboldt says that in 1553, only thirty-two years after the conquest by Cortez, the production was "so great in

Mexico that it was exported from Vera Cruz and Acapulco into Spain and Peru."[1] In his account of that industry, at the commencement of the present century, he stated: "The cultivation of sugar-cane has made such rapid progress within these last years that the exportation of sugar at the port of Vera Cruz actually amounts to more than half a million of arrobas, or 6,250,000 kilogrammes." That, reduced to pounds, is 13,980,312.

From the report of Ward, the British minister in 1827, we have the following testimony: "The State of Vera Cruz alone is capable of supplying all Europe with sugar. Humboldt estimates the produce of its richest mould at 2,800 *kilogrammes* per *hectare*, while that of Cuba does not exceed 1,400 kilogrammes, so that the balance is as two to one in favor of Vera Cruz."[2] About twenty years later, Mayer, the historian of Mexico, wrote: "The sugar-cane is one of the most valuable agricultural products of Mexico, and we are convinced, from personal observation, that the estates in the *Tierra Caliente*, where it is chiefly raised, are the richest as well as the most beautiful in the Republic."[3]

In 1873 U. S. Consul Cassard, writing from the State of Tabasco, said: "Sugar-cane is exceedingly prolific, and could furnish half of the sugar now consumed in the world if extensively and properly cultivated. A plantation, when well started, will yield thirty years and over continuously without replanting, giving an average of two crops in fifteen months. The exuberance of the stalks generally is such as to shade the ground, and thus prevent the growth of weeds, requiring then but little labor to keep a plantation in good order. The average yield is one ton of sugar per acre, exclusive of molasses and rum, with which expenses can be covered."[4]

The report of the United States consul from the State of Vera Cruz in 1874 states: "The sugar-cane once planted lasts from fifteen to twenty years, and this with the very little care that is given it by the Mexicans generally. It is supposed that the same planting will last even for a longer time when cultivated with the intelligence and experience of the foreign planter."[5]

Again, in 1875, a consul of the United States reported: "The plantations in the State of Morelos, (adjoining the States of Mexico and

[1] See Humboldt's "New Spain," III, 4.
[2] Ward's "Mexico," I, 21.
[3] Mayer's History of Mexico, II, 62.
[4] "Commercial Relations" of U. S. for 1873, pages 856–7.
[5] Report on Commercial Relations for 1874, p. 876.

Puebla,) and which are over some forty in number, now produce far more than is required for home consumption, and are capable of increasing their products three or four-fold."[1]

Similar testimony comes from States along the Pacific coast of Mexico. In the recent prospectus of the Colima Coffee Company are some statistics about the number of trenches occupied by sugar-cane, with this remark: "The climatic conditions above noticed secure the plants from frost, so that they are almost perennial."

In 1883 Wm. G. LeDuc, late United States Commissioner of Agriculture, visited Sinaloa in the interest of the American & Mexican Pacific Railway. In his report he says of the country along the coast between Mazatlan and Alamos as follows: "As an example of the productive power of this soil, tropical sugar-cane planted on the ranche of Messrs. Ortiz has been cut for nine years successively without replanting and satisfactory crops are yet obtained, their product of sugar for the last year's crop being 20,000 arrobas. They expect to increase the amount to 40,000 this coming season. I was also informed that one large field of cane on the Fuerte river had been cropped for eighteen years successively without replanting."

Again, in a recent pamphlet on the Mexican Southern Railway by Robert B. Gorsuch, an engineer who has resided in Mexico for many years past, we find the following:

"Sugar-cane flourishes luxuriantly in every portion of Southern and Central Mexico at the altitude suited to its production, and so well adapted is the climate to its full development that, in many districts, one planting will yield an abundant crop for four or five consecutive years, and may even then continue to be cut during another equal period but with diminished product.

"In the State of Oaxaca sugar is so cheaply produced that in many localities it sells in its crude or unclarified form ("panoche," or brown sugar in small cakes) for one cent per pound."

The official statistics of the production of sugar in the various States during the last attainable year show their present relative rank to be as follows: [2]

| *States.* | *Value.* | *States.* | *Value.* |
|---|---|---|---|
| 1. Morelos | $1,650,000 | 4. Oaxaca | $887,500 |
| 2. Vera Cruz | 1,552,500 | 5. Puebla | 656,250 |
| 3. Michoacan | 1,068,750 | 6. Yucatan | 400,000 |

[1] Report on Commercial Relations for 1875, p. 1118.

[2] From "Estadistica de la Republicana Mexicana," by Emiliano Busto.

| States. | Value. | States. | Value. |
|---|---|---|---|
| 7. Sinaloa | $394,375 | 16. Campeche | $74,750 |
| 8. Jalisco | 368,812 | 17. Coahuila | 55,125 |
| 9. Nuevo Leon | 318,750 | 18. Hidalgo | 46,318 |
| 10. Tamaulipas | 300,000 | 19. Chiapas | 20,937 |
| 11. Queretaro | 281,250 | 20. Guanajuato | 15,750 |
| 12. Sonora | 276,250 | 21. Colima | 12,750 |
| 13. Tabasco | 137,500 | 22. Territory Lower Cala. | 5,625 |
| 14. Mexico | 131,250 | | |
| 15. Guerrero | 106,875 | | $8,761,317 |

It will be observed in glancing over the above column that 22 of the total 29 States and Territories of that country are now producing sugar in considerable quantities. Also that it is produced as extensively in the highland as lowland States.

In this connection the record of imports of sugar by the United States becomes of interest. During the single fiscal year ending June 30, 1883, it imported as follows, in value:

| | |
|---|---|
| Sugar and molasses (dutiable) | $91,948,869 |
| Sugar and molasses (free of duty) | 7,377,426 |
| Total | $99,326,295 |

In view of this enormous annual demand from an adjoining Republic it requires no stretch of the imagination to believe that the Mexican States will on the completion of the six international railways projected from the Rio Grande double their sugar products several times within the coming few years.

## Coffee.

Of this product Ward, the British minister to Mexico, said, in 1827, in his valuable work on the resources of that country:

"Coffee is another of the tropical productions for which the soil of Mexico is admirably adapted." After describing two large estates, he said they "contain about 500,000 coffee plants, 50,000 of which were in full produce when I saw them in 1826. The crop of the preceding year amounted to 5,000 arrobas, or 125,000 pounds, which gives two and a half pounds of coffee as the average production of each plant. I am induced to believe that this will be the ordinary produce of good land throughout Mexico; it considerably exceeds that of Havana, where Humboldt gives 860 *kilogrammes* as the average of a *hectare* of land containing 3,500 plants; but it is a much lower estimate than any Mexican planter would make, as in many parts of the country from three to

four pounds are said to be a fair average crop. I could not ascertain, however, that this calculation was founded upon correct data; and I do not, therefore, give it as one that may be strictly relied upon; but I know one instance of a single coffee tree having produced twenty-eight pounds of coffee in the garden of Don Pablo de la Llane, at Cordova, and it is the certainty that this fact is unquestionably true that induces me to give, as the possible average of good grounds in Mexico, a produce more than double that which in the island of Cuba is the maximum of the best year in three."[1]

It grows on the highlands as well as on the lowlands, as may be seen from the following by Minister Romero in a pamphlet on that subject:

"The temperature of a place has a close connection with the altitude above the level of the sea, for, as a general rule, it is known that the greater the altitude the lower is the temperature. It is not long since that lowlands used to be those preferred for coffee. Experience has shown that the best lands for this cultivation are those situated from three to four thousand feet above the level of the sea. Coffee planted some 500 feet above the level of the sea has been observed to yield hardly half a pound per tree; from 500 to 1,000 feet it yields one pound per tree; from 1,000 to 2,000 feet the yield amounts to two pounds per tree; from 2,000 to 3,000 feet the yield is three pounds per tree, and from 3,000 to 4,000 feet as much as four pounds per tree has been obtained in the best lands and under the most careful cultivation.

"The experience of other persons in several places shows the accuracy of these observations. Mocha coffee thrives in the mountains of Arabia Felix. Choice Colima comes from the heights of Platanarillo. The districts of Cordoba and Orizaba, the coffee of which is highly esteemed, will be found to be at an altitude of 2,500 to 3,000 feet above the level of the sea.

"A person not familiar with coffee plantations will be easily deceived with the aspect presented by the trees in the lowlands, for sometimes, and especially when new, their leaves show a healthy green color, and look to great advantage, but in a short time they change their aspect and are reduced to reeds, and the quantity of fruit they produce is invariably small."

In Williams' report upon the Isthmus of Tehuantepec we find the following:

"The banks of the Coatzacoalcos exhibit in a wild state the greatest abundance of coffee, and, with few exceptions, no pains are taken to cul-

[1] Ward's "Mexico," I, 72 and 73.

tivate it, although the quality is admitted to be very superior. This neglect may be readily accounted for in the universal preference which exists among the natives for chocolate."[1]

United States Consul Hoyt, in a report to the State Department, dated Minatitlan, November 31, 1868, says: "Coffee attains perfection in three years almost anywhere on the Isthmus."[2]

Hon. John W. Foster, late United States minister at Mexico, in an elaborate review of Mexican coffee, published by the United States Department of Agriculture in 1876, said its quality was "equal to the best known in any country," and that Mexico in coffee alone "possesses a far greater source of wealth and prosperity" than in her product of silver.[3] To appreciate this tribute we should bear in mind that her yield of silver averages about $26,000,000 annually.

In the recent prospectus of the Colima Coffee Company, of which Hon. R. C. McCormick is president, is the following:

"Specimens of coffee from this and a like favored region in the State of Michoacan, exhibited at the Centennial Exposition of 1876, received the first and second prizes, eclipsing the far-famed Mocha. No special manures are needed to insure the crop. Under skilful management, especially by restoring the hull to the soil, and by pruning so as to prevent excessive woody growth, trees may be kept in full bearing for three-quarters of a century, some having been planted on like soils and retained their health and vigor for a known period of nearly fifty years.

"Over 60,000 trees are now in bearing at Agua-Zarca, which, when full, will yield from two to three pounds per tree. Exceptional cases of larger yield are not included."

The official statistics of the products by States during the last attainable year are as follows:[4]

| *State.* | *Value.* | *State.* | *Value.* |
|---|---|---|---|
| 1. Vera Cruz | $1,470,000 | 6. Tabasco | $58,800 |
| 2. Colima | 225,000 | 7. Morelos | 52,500 |
| 3. Chiapas | 89,180 | 8. Guerrero | 10,112 |
| 4. Oaxaca | 81,600 | | |
| 5. Michoacan | 73,190 | | $2,060,382 |

To illustrate the incentive which Mexico has for a more extensive development of this industry, we may add that during the single year end-

[1] Barnard and Williams' Survey, p. 188.

[2] Commercial Relations for 1868, p. 652.

[3] Monthly Report of Department of Agriculture for 1876, pp. 269–74.

[4] "Estadistica de la Republicana Mexicana," by Emiliano Busto. Mexico: 1880.

ing June 30, 1882, the United States imported coffee to the extent of $46,041,609 in value, and from the following countries:[1]

| | |
|---|---|
| From Brazil | $29,520,151 |
| From Venezuela | 4,599,023 |
| From West Indies | 3,080,254 |
| From Asia | 2,867,932 |
| From Central America | 2,512,230 |
| From Mexico | 1,817,584 |
| From United States of Colombia | 857,612 |
| From all other countries | 786,823 |

Mexico should step from the sixth to the first position in this list.

## Cotton.

The production of cotton is not a new element of wealth in Mexico, but is the revival of an industry which flourished under the civilized native races long before America was known to Europeans. All historians agree in regard to the extensive use of cotton by the Aztecs; and what they manufactured they undoubtedly produced, for they had little intercourse with the outside world. The historian of the "Conquest of Mexico," in describing the first presents from Montezuma to Cortez, mentions, as one item, "ten loads of fine cottons."[2] Of another embassy, from Montezuma to Cortez, he states that slaves brought as presents "curtains, coverlets, and robes of cotton, fine as silk, of rich and various dyes, interwoven with feather-work that rivalled the delicacy of painting. There were thirty loads of cotton cloth in addition."[3] Another historian of Mexico says: "Cotton was among the indigenous products of Mexico at the time of the Conquest; and the early adventurers not only found it to constitute the common vesture of the masses of the people, but also that the most delicate and luxurious articles of dress were made of it. The Aztecs possessed the art of spinning it to an extreme degree of fineness, and of imparting to it the beautiful and brilliant dyes for which they were celebrated; but both those mysteries were entirely lost in the general destruction of aboriginal arts and records by the Spaniards. Notwithstanding the natural anxiety of Spain to furnish her colonists with her manufactures, she could never prevent the people from weaving and wearing this spon-

[1] Compiled from Quarterly Report of Bureau of Statistics, No. 3, 1882–'83.

[2] Prescott's "Conquest of Mexico," I, 302.

[3] Ditto, p. 320.

taneous product of their soil."[1] These facts indicate very clearly that Mexico was, before the days of Spanish rule, an extensive producer of cotton.

In a report to the State Department, dated April 13, 1880, Mr. Strother, United States consul-general at the city of Mexico, gives the following facts about the present production of cotton in that Republic:

"The principal cotton-producing States are: Vera Cruz, Guerrero, Chiapas, Oaxaca, Colima, Michoacan, Jalisco, Sinaloa, Sonora, Chihuahua, Durango, Coahuila.

"VERA CRUZ.—The product of this State is estimated at about 8,000,000 pounds per annum. There are no data to enable us to estimate the product per acre, as land in this State is not measured by the acre, but rudely estimated by the square league, or by the still more unreliable standard of the 'caballeria,' which signifies as much as a horse can travel round in a day.

"The plant, however, grows so vigorously that each stock yields from two to five hundred pods, and it is calculated that the average yield to the acre is about 15 per cent. more than in the United States.

* * * * * * * *

"GUERRERO.—It is estimated that this State produces 5,300,000 pounds of cotton in the seed, about one-third of which, 33⅓ per cent., is pure fibre. We have no data to calculate the average produce per acre, and no means of even approximating the amount of land under culture.

"Under the present system the great proprietors do not find cotton culture profitable, and consequently it is chiefly raised by small renters, who cultivate it in irregular patches by their own labor and the assistance of their families. In view, however, of the fertile soil and favorable climate of this region, it is believed that in the hands of more enterprising and intelligent cultivators the States of Guerrero and Oaxaca could be made to produce more cotton than all the Southern States of the American Union combined.

* * * * * * * *

"JALISCO.—The crop in this State is about 2,000,000 pounds per annum; no conjecture as to the acreage under cultivation. It is estimated that an acre will produce 1,000 pounds of seed cotton, of which one-third is pure fibre.

* * * * * * * *

"COLIMA.—The annual crop of this State is stated at 257,000 pounds. In response to all other questions, the same as Jalisco.

[1] "Mexico: Aztec, Spanish, and Republican," by B. Mayer, II, 67.

"SINALOA.—The estimated annual crop of this State is 1,750,000 pounds. The average yield per acre is estimated at 1,050 pounds; of seed 700 pounds, of pure fibre 350 pounds. * * * The crop in this region suffers from superabundance of rain and insects, and is considered very uncertain.

"SONORA.—The crop of this State averages about 1,000,000 pounds per annum, and the responses to other questions the same as in Sinaloa.

"Three years ago the culture of cotton was introduced into Lower California, whose crop is reported at 500,000 pounds. The crop is said to be more certain there than elsewhere in Mexico and of decidedly superior quality. Its culture is now engaging the attention of landholders in that section, and great hopes are entertained of its future.

"DURANGO.—The annual product of this State is estimated at 4,000,000 pounds; the product per acre at 1,500 pounds, yielding 420 pounds pure lint. * * * The crops suffer very seriously from the attacks of vermin, such as worms, locusts, and pocks, (viruela.)

"COAHUILA.—The annual production of this State is estimated at 3,000,000 pounds. Last year's crop being a partial failure, did not probably exceed 1,250,000 pounds; machinery, wages, and other details same as in Durango. In the Laguna cotton is perennial and does not require to be planted oftener than once in ten years. This district, containing about 1,200,000 acres, lies partly in Coahuila and partly in Durango, is of extraordinary fertility and well adapted to cotton, but is very little cultivated, and the cotton product of Coahuila is diminishing yearly.

"From the States of Chiapas, Oaxaca, Michoacan, and Chihuahua I have not been able to obtain any reports whatever. While this leaves us without a basis for even a conjectural estimate of the whole amount produced in the Republic, we may nevertheless suppose that the general conditions of production and preparation for market are very nearly the same in these States as those from which we have heard."

During the last attainable year the relative rank of the States now producing cotton was as follows in value of product:[1]

| | | | |
|---|---|---|---|
| 1. Vera Cruz | $3,520,000 | 8. Colima | $156,000 |
| 2. Durango | 854,000 | 9. Michoacan | 140,000 |
| 3. Sinaloa | 500,000 | 10. Chihuahua | 70,000 |
| 4. Guerrero | 495,000 | 11. Hidalgo | 66,675 |
| 5. Coahuila | 309,375 | 12. Nuevo Leon | 19,705 |
| 6. Jalisco | 306,000 | | |
| 7. Tamaulipas | 168,000 | | $6,605,831 |

[1] From Statistical Chart of Mexico, by Bodo von Glümer.

This statement varies somewhat from the one preceding, either because the statistics are not for the same year or because of the difficulty in getting satisfactory information; but the two together give an approximately correct idea of the principal cotton States and the amount now produced.

## Grazing.

Soon after Cortez completed the conquest of Mexico he received from the King of Spain a grant of large estates near the Isthmus of Tehuantepec.[1]

On his return from Spain to Mexico, in 1530, says the historian, "he imported large numbers of merino sheep and other cattle, which found abundant pastures in the country around Tehuantepec."[2] Three hundred and twenty years later, or in 1850–'1, the same grazing facilities were reported by Williams in his survey of the Isthmus. He says:

"The immense potreros which border all the principal streams on the northern division furnish rich pastures of never-failing verdure for numerous herds. During the short season that these potreros are inundated, the cattle are driven to the more elevated savannas remote from the river margins. The extensive table-lands in the central portions of the Isthmus, as well as the plains bordering the Pacific, also furnish abundance of excellent pasturage. Indeed the whole country seems peculiarly well adapted to the raising of horned cattle. With little care on the part of their owners they increase rapidly, grow to a large size, and have a remarkably sleek and well-favored appearance. Enjoying a range of the finest pastures in the world, they are usually in good condition and make fair beef."[3]

In the northern States of Mexico the grazing facilities are equally good. Dr. Wislizenus in his valuable report says of Chihuahua and New Mexico, (the latter then being a portion of Old Mexico,) as follows:

"As a grazing country both States are unsurpassed by any in the Union. Millions of stock can be raised every year in the prairies of the high table-land and the mountains. Cattle, horses, mules, and sheep increase very fast, and if more attention were paid to the improvement of the stock the wool of the sheep alone could be made the exchange for the greatest part of the present importation."[4]

[1] Prescott's Conquest of Mexico, III, 306–7.
[2] Ditto, p. 332.
[3] Barnard & Williams' Survey, p. 202.
[4] Senate Doc. No. 26, 1st sess. 30th Cong., p. 83.

The United States Consul at Chihuahua said of that State in his report for 1871:

"The State is particularly adapted to stock raising; the warm climate and very mild winters afford great advantages in this branch of business." * * * "There are, at this time, very near eight hundred thousand sheep and very near two hundred and fifty thousand cattle in the State."[1]

In 1874, United States Consul Gillespie said in his report on the Territory of Lower California:

"It may be truly said that there is no country on the face of the earth where the herdsman has fewer obstacles to contend against, and certainly none where the beef—tender and enriched by the flavor of the sweet grasses of the mountains or table-lands, watered by the purest streams—is more worthy of esteem than Lower California. It is true that during seasons of drought many cattle die, but this cannot be wondered at in connection with what has been said about the deficiency of wells and pumps."[2]

United States Consul Sutton, in a recent and elaborate report dated Matamoras, April 13, 1883, says of Northern Mexico:

"Roughly speaking, a line drawn from Guaymas, on the Gulf of California, to Tampico, on the Gulf of Mexico, represents the chief cattle range of Northern Mexico. From this enormous territory deduct one-third for mountains, deserts, and tillable land, and the remaining two-thirds is grazing land.

"Over all this territory, in every extreme of climate, from the thin, cold air of the high plateau to the low, hot lands of the coast of Tamaulipas, range the hardy progenitors of the Texas cattle—long-horned, large-boned, gaunt, immense beasts; they are simply *frames* upon which the sweet grasses of Kansas and the West will make fine beef. Their greatest value, however, is not for themselves alone. Descendants of the fine stock brought from Spain by the Spanish conquerors, nature has adapted them, through generations of neglect, to their wild life. They are hardy; they are wild; and while their rating as to class is low, yet the good blood of the past generations is still there. As I have said, they themselves will make good beef when fattened on the Western plains; but crossed with the improved bulls from the East or from Europe, one or two crosses brings them far above what the same would do for the ordinary class of cattle in the United States. Not only do

[1] Commercial Relations for 1871, p. 898. [2] Ditto for 1874, p. 870.

they come up to a high grade of stock much more rapidly than the ordinary American cattle, but they still retain their great frames, the dark red color of the meat, and breed with great rapidity, but they are what the Western stockmen admiringly call 'good rustlers.' They still retain their wildness, and hence do not stay tamely around water-holes eating the short, poor grass, as do the American stock, getting thin and weak, to die in the first great storm. They multiply rapidly, stay out in the good grass and brush, have large frames, fatten rapidly, and make the best grass-fed beef that goes East. No wonder that the stockmen of our plains are anxious to get them.

"This portion of Northern Mexico would include the States of Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas, and portions of other States.

"In this Territory are, on a reasonable estimate and from latest data available, an area of 300,000 square miles, and about a million of inhabitants. Of this Territory probably two-thirds is suitable for, and more or less used for, the raising of cattle, horses, goats, sheep, and mules. I can only roughly estimate the number of live animals in this Territory.

"In Texas, with an area of 237,000 square miles, there were, in 1880, about 7,500,000 such animals, divided as follows: neat cattle, 4,000,000; horses, 800,000; mules and asses 132,000; sheep, 2,500,000.

"In this portion of Northern Mexico, with an area of, say, 300,000 square miles, there may be now something like 6,500,000 animals, and which I estimate as being divided about as follows: goats, 2,500,000; neat cattle, 1,500,000; horses, 1,000,000; sheep, 1,000,000, and mules, 500,000.

"The difficulty of obtaining reliable statistics in Mexico makes it impossible for me, at this time, to do more than give the above rough estimate. I hope, however, during the year to obtain some reliable data on this industry."

## Tropical Fruits.

An almost endless variety of tropical fruits are produced in various parts of the Republic, and in great profusion. In a speech before the Chamber of Commerce in New Orleans, in 1875, Hon. J. W. Foster, late United States minister to that country, said: "Mexico produces them of almost an indefinite variety of superior quality, and in great abundance near the coast and in all its ports. If there were direct and rapid communication with Galveston and New Orleans all of the South and West up to the Great Lakes could, by means of the railways starting

from these two cities, be provided with the tropical fruits of Mexico, fresher, of better quality, and cheaper than those we now have."

The official reports of Mexico—at least those to which we have had access—and the United States consular reports from that country contain very little general and statistical information on this subject. Here and there we find fragmentary allusions to the adaptability of the soil to the production of tropical fruits, and some facts about the profusion of their growth.

United States Consul Willard, in his report from Sonora in 1871, says the valleys of the southern portion of that State produce in abundance oranges, lemons, and figs.[1]

United States Consul Trowbridge, in a report from Vera Cruz in 1873, says the soil and climate of that State is adapted to the growth of all the tropical fruits.[2]

United States Consul Johnson, in a report from Tuxpan, in the State of Vera Cruz, in 1874, says that part of Mexico produces bananas, plantains, pine-apples, oranges, lemons, mangoes, and many other or all of the tropical fruits. He says: "An acre of bananas and plantains yields $100 to $125 per acre, and only require to be planted once, for as fast as the mother stalk gives its bunch of fruit and dies, a dozen little ones starts, phœnix-like, from its roots. They are planted about 9 feet apart, but after two or three years there are in each hill a dozen stalks, each of which bears its bunch of fruit worth here from 12 to 18 cents per bunch.

"The pine-apples yield even more, for they are planted in rows, about 3 feet apart each way, thus producing about 4,000 to the acre; worth here about about 6¼ cents each, or over $200 per acre. Like the bananas, they only require to be planted once in ten or twelve years, and grow from the root, as each plant only gives one fruit. The first year you have but one bunch of bananas or one pine-apple from the root, but after that you are obliged to thin them out or the fruit becomes inferior."[3]

In Williams' elaborate report upon the Isthmus of Tehuantepec we find the following:

"The warm, humid valleys of the Gulf shore appear to be the natural position for the banana, where the fruit is occasionally eight inches in circumference, with a length of ten or twelve. Forty plants growing on

[1] Commercial Relations for 1871, p. 903.
[2] Commercial Relations for 1873, p. 863.
[3] Commercial Relations for 1874, pp. 877–879.

a space of 1,070 feet are calculated to furnish 4,400 pounds of nutritive matter—a quantity above the acreable product of any cereal crop. In other words, the same extent of ground under bananas which will support fifty individuals, when under wheat will only support two."[1]

In the report of Commodore Shufeldt's survey of the same Isthmus is the following by Dr. Spear, who was a member of that expedition:

"There are as many as fifteen well known varieties of the banana, some of which are of a very superior quality. The manzana variety is the most delicious of all, and, as its name indicates, has the flavor of the apple. Like the orange, the best bananas are found on the Atlantic plains and in the central division, and they are ripe at all seasons of the year."[2]

In the same report is the following:

"Oranges grow in all parts of the Isthmus, but those of the Atlantic plains and the central division are the best. At Santa Maria Chimalapa this fruit is particularly fine, and there are two crops yearly, but not always on the same tree." * * * "On the banks of the Coatzacoalcos there is an orange grove of about ten acres, planted by an American, where the fruit is equal to the best Havana oranges. We measured a large basketful, taken indiscriminately from the trees, and found the average circumference of the oranges to be $9\frac{17}{20}$ inches. We estimated that the ripe crop we found on this deserted and untilled orange grove was as much as one hundred and fifty bushels to the acre. On the Isthmus of Tehuantepec there is no frost to blight this crop as there is occasionally in Florida and Louisiana, nor hurricanes to destroy it, as in the West Indies; nor are the northers violent enough on the Atlantic plains to materially injure it. Oranges of the very best quality can be readily grown along the banks of the Coatzacoalcos and Uspanapa in quantity sufficient to supply the market of the United States."[3]

In still another part of Mexico—the State of Colima, on the Pacific coast—a variety of tropical fruits are produced.

In the recent prospectus of the Colima Coffee Company we find the following mention of the tropical fruits produced upon their plantation:

"The culture of fruits will for some years be pursued for consumption on the estate or for local markets. At present there are about 750 pine-apple plants, 250 mangoes, 250 orange, 450 lime, and 125 sweet lime trees, 125 mammy, 150 cocoa-nut trees, &c. The banana must be

[1] Barnard & Williams' Survey, p. 194.
[2] Shufeldt's Survey, p. 120.
[3] Ditto, pp. 119–120.

largely propagated, as it is the shade tree which the coffee plant best favors. It is grown from slips, and attains a suitable height in a year. When transportation to the marts of the United States will permit, its fruit can hardly fail to be a source of income, as its planting as a shade tree will be large. The coffee trees are to be set out eight feet distant, in rows nine feet apart, each thus occupying an area of 72 square feet. By an easy calculation it is seen that there will be 605 coffee trees to the acre, and to gain a planting of 500,000 trees over 826 acres will be covered. One banana is needed in the centre of alternate rows of coffee trees, and for every three in such rows, six being shaded by one banana. So that when the coffee plantation is completed there will be eighty-three and one-third thousand banana trees, producing at least 4,000,000 of the fruit at each cropping."

In an address before the Pittsburg Chamber of Commerce on the 13th of September, 1878, Señor Zamacona, at that time Mexican minister to the United States, called attention to the fact that tropical fruits in Mexico fall to the earth, and rot for want of a market. Here, then, is a source of wealth which that country has neglected for want of transportation facilities. How great a source of wealth it may be when adequately developed is clearly apparent when we consider the great and growing demand by other nations for the more important tropical fruits.

Of the demand for oranges and lemons in the United States and Europe, the Annual Report of the United States Department of Agriculture for 1877 says as follows: "The statistics of the orange trade, both in this country and Europe, bear out the statement that but few valuable fruits ever exceed the demand." * * * "The importations into Great Britain show that the trade and consumption in these frits have more than doubled in that country during the past ten years." * * * "The importation of oranges and lemons into France from Spain and Italy have increased in the last few years more than fourfold in quantity."[1]

With such an incentive before her, doubtless Mexico will soon develop this important and profitable industry.

## Other Agricultural Wealth.

Among the other important sources of agricultural wealth with which a fertile soil and varied climate have so profusely endowed Mexico may be mentioned the fibre plants, such as henequen and ixtle; the maguey

[1] Report of Department of Agriculture for 1877, pages 566–567.

plant, from which the Mexican national beverage or whiskey is produced; chile, a staple article of food; the vegetable dyes, the supply of which may be made equal to almost any demand; cochineal, which was produced in almost fabulous quantities under Spanish rule, and cacao, a plant from the fruit of which the Aztecs made the popular drink chocolate long before it was known by Europeans.

Space does not permit an extended review of these products. A few general notes, however, may not be uninteresting.

*Maguey.*—This plant is a species of aloe, which, according to Ward, is found wild in nearly every part of Mexico.[1]

Its great importance may be seen from a glance at its varied products enumerated by Dr. Skilton, formerly United States consul-general at the City of Mexico. In his report of December 25, 1876, he says:[2]

"Pulque is a whitish liquor distilled from the Mexican maguey, (agave or aloe,) containing water, gluten, and alcohol. It has a singular smell and a gelatinous taste. Its medicinal qualities have been much recommended, and it is said to be very nourishing. In the absence of water it quenches thirst, but the intoxication arising from it, though slower, is not less potent than from other liquors. Pulque is made by the fermentation of the hydromel, under the influence of the atmosphere. This liquor, the discovery of which is attributed by fiction to a queen called Xochitl, is the general beverage throughout the central table-lands. It is very cheap, and immense quantities are daily brought into the capital. A special train is devoted to transporting pulque from the haciendas, by which the railway passes to the City of Mexico.

"Aguardiente is a liquor distilled from pulque, and refined by means of animal carbon.

"Mescal is another class of liquor obtained from the fleshy and whiter part of the leaves after they are roasted and pressed. The juice thus extracted is fermented by the addition of pulque and then passes through a still.

"From the leaves, stripped of their fleshy substance, when well washed in clear and soapy water, and dried carefully, a kind of thread, called *pita*, is made, which is used in the manufacture of ropes, and for other purposes.

"Paper made and articles woven from the maguey plant were in use by the Aztecs and the first European settlers in the colony.

"From the hydromel, when mixed with lime and heated to a tempera-

[1] Ward's Mexico in 1827, I, p. 55. [2] Commercial Relations for 1876, pp. 745–6.

ture of 100°, and after successive filtrations, a syrup is obtained, which, being crystallized in conical moulds, produces excellent loaves of sugar. The maguey also gives spontaneously a species of gum now in use, analogous to gum-arabic. After the maguey has finished producing hydromel, it is susceptible of important service. Its ashes, mixed with water, which is afterward boiled and left to evaporation, produces potassium, which is purified by repeated washings.

"Various insects are found in the maguey plant, as the *Bombyx agavis*, or *red worm*, the *Tingis bombicida*, and the *Velia melis agavis*.

"Mezcal, extracted from the different species of the maguey plant, is a pure beverage, possessing tonic and aperitive qualities. In color and taste it is something similar to Holland gin, and is distilled to a strength of 12° to 18°. The average price per barrel of 40° is from $15 to $20.

"In many of the States there is an immense consumption of this liquor, which, on account of its purity and medicinal qualities, is taken in preference to wine and mixed liquors from abroad.

"Tequilla, something similar to mezcal, is considered far superior in its tonic and medicinal qualities, and possesses a more agreeable flavor. When kept for a year or two it resembles Scotch whisky. Like mezcal, it is produced from the agave, of which there are several species, and one of a peculiar quality grown at the place from which this liquor derives its name, Tequilla, in the State of Jalisco. In the City of Mexico it is worth from $30 to $35 per barrel."

*Ixtle or Pita.*—In Williams' report on the Isthmus of Tehuantepec is the following mention of this plant:

"Among the spontaneous products is the *bromelia pita*, or ixtle of the Isthmus, which differs in some respects from the *agave americana* of Europe, the *pulque de maguey* of Mexico, and the *agave sisalana* of Campeachy. Of this prolific plant there are numerous varieties, all yielding fibres which vary in quality from the coarsest hemp to the finest flax. Nor is the value of the plant diminished by its indifference to soil, climate, and season. The simplicity of its cultivation and the facility of extracting and preparing its products render it of universal use. From it is fabricated thread and cordage, mats, bagging, and clothing, and the hammocks in which the natives are born, repose, and die. The fibres of the pita are sometimes employed in the manufacture of paper; its juice is used as a caustic for wounds, and its thorns serve the Indians for needles and pins."[1]

[1] Barnard & Williams' Survey, p. 184.

In a conversation with a correspondent of the New York *World*, Dr. Trowbridge, the United States consul at Vera Cruz, in speaking of this product as found in Southern Mexico, said: "There is a species of cactus here called pita, (I do not know its botanical name,) some of the fibres of which are sixteen feet long. It is strong and silky, and capable of being divided into threads, from which gossamer webs might be woven. In fact a few months ago a Vera Cruzano sent some of the fibre to England and had a few handkerchiefs made, which were extremely beautiful and appeared more like silver tissue than linen, and were quite strong." * * * "There are millions of acres of the pita plant, which, if utilized, might bring an immense revenue to the coffers of this impoverished country."[1]

The annual supply of this product is now furnished by eight States.

*Henequen.*—"This plant," says United States Consul Lespinasse, in his report to the State Department in 1879, "may be found in profusion in a wild state throughout Yucatan, and forms the nucleus whence all the present cultivated hemp plantations have been formed." * * * "As the plant grows a stem shoots out from the centre of the plant, and the leaves gradually detach themselves therefrom in a spear-like form, with sharp prickles along the edges, and a strong, black, acute needle-like thorn at the point. The plant requires from five to seven years to attain its full growth. At the end of this period the leaves have an average length of four feet. A hemp plant will yield from ten to fifteen years. Each plant yields about twenty-six leaves during the year, sixteen in the rainy season and ten in the dry season. Each leaf four feet long produces about three-fourths of an ounce of fibre. It requires from 7,000 to 8,000 leaves to make a bale weighing 400 pounds."

Next to the precious metals henequen has for the past four years constituted the chief item of Mexican exports, the value exported during the fiscal year ending July 31, 1882, being $2,662,106.[2]

The production is almost solely confined to the States of Yucatan and Campeche.

*Chile.*—This product is a very popular one in Mexico, and in value ranks seventh among the staple agricultural productions of that country, its value during the last attainable year being $4,196,482.

It was thus described by Ward, the British minister, in 1827: "Whole estates are devoted, on the table-land, to the cultivation of this most

[1] New York *World*, May 3, 1880.

[2] Mexican *Financier* of July 28, 1883.

powerful stimulant, and few are more productive, as it constitutes one of the necessaries of life with the Indian and Mestizo population, and is used in very large quantities at the tables of the Creoles of all ranks. Its pungency is so great that amongst the uninitiated it produces absolute excoriation; but the palate becomes accustomed to it by degrees, and habit renders it indispensable. It is used by the lower classes as a seasoning to the insipid tortilla, and the two together furnish a meal which they would not exchange for an allowance of meat and wheaten bread."[1]

This staple article, like Indian corn, is produced in considerable quantity in all of the total 29 States and territories of Mexico.

*Vegetable Dyes.*—Of these products Williams says in his report on the Isthmus of Tehuantepec:

"The enumeration of all the vegetable dyes found on the Isthmus, with all that might be said of the numerous varieties, would constitute matter for a well-filled volume on botany, rather than the general details of a statistical report. Many, nevertheless, deserve an especial notice, either from the brilliant colors which they yield or the pecuniary considerations involved in their growth and production. Among these may be classed the indigo-trees, which are indigenous to Mexico."[2]

Of this dye, Shufeldt's report says: "The most important article of export cultivated on the Isthmus is indigo. Its cultivation is confined entirely to the Pacific side, in the light and dry atmosphere of which this plant seems to do remarkably well."[3]

The official representative of the United States, in a report to the State Department, dated Tehuantepec, October 15, 1871, says: "Indigo is the principal produce of this part of the country on the Pacific plains, from twenty to forty miles wide in a direct line from the sea to the Cordilleras, and about eighty miles in length, running nearly east and west." * * * "If an interoceanic canal should be constructed across the Isthmus of Tehuantepec the natural influx of foreign population drawn by such an enterprise would develop in a few years the growth of indigo to an extent sufficient to rival the East Indies, and increase many other products in corresponding proportions."[4]

It is now produced in eight States of Mexico.

[1] Ward's "Mexico in 1827," I, p. 54.
[2] Barnard & Williams' Survey, p. 189.
[3] Shufeldt's Survey, p. 118.
[4] Commercial Relations for 1871, p. 916.

The imports of indigo by the United States alone during the year ending June 30, 1883, were $3,475,112 in value, of which more than half, or $1,822,171, came from the distant British East Indies. Here, then, is another incentive for Mexico to supply an important demand.

*Cochineal.*—How extensively this product formerly figured in the commerce of Mexico is told by the British minister who resided in Mexico about 1827. He says of the State of Oaxaca, where it is chiefly found: "By the official returns which I possess it appears that the value of cochineal entered upon the books of this office up to 1815 was $91,308,907, which, upon fifty-seven years, gives an average of $1,601,910 per annum, without making any allowance for contraband."[1] The historian Mayer brings the record down to a later date as follows: "It appears that from 1758 to 1832, inclusive, or in seventy-five years, 44,195,750 pounds of cochineal were produced in the State of Oaxaca alone, which were worth $106,170,671 at the market price."[2]

We see no good reason why Mexico should not regain some of her lost prestige in this industry, for the United States, during the year ending June 30, 1883, imported cochineal to the extent of $406,035 in value, of which about three-fourths came from the Spanish possessions of Africa and adjacent islands.

*Cacao.*—Nearly all of this product is grown in the States of Tabasco and Chiapas, at the southern extremity of Mexico. Williams reports two qualities, and of one he says: "The quality is said to be superior to that of Guayaquil or Maracaibo, and the prolific return which characterizes its cultivation is sure evidence of its importance and value. The lands east of the Coatzacoalcos seem particularly adapted to its growth."[3]

United States Consul Cassard says in his report from Tabasco in 1873: "Cacao is successfully cultivated on a large scale. Its four yearly crops place its culture among the most profitable."[4]

## Its New Development.

In view of the above facts and figures and many others which might be cited to the same effect, we predict that the agricultural wealth of Mexico when adequately developed will, like that of California, eclipse

[1] Mexico in 1827, G. H. G. Ward, I, pp. 84–5.
[2] Mayer's History of Mexico, vol. II.
[3] Barnard & Williams' Survey of Isthmus of Tehuantepec, p. 187.
[4] Commercial Relations for 1873, p. 857.

its riches in silver and gold. Already Mexico is awakening to the importance of this industry as a source of wealth. In a leading editorial upon the subject the *Mexican Financier* says: "There is no more encouraging feature of the bright prospects of Mexico to-day than the increased attention received by agriculture everywhere in the land. There is no act of the Government more praiseworthy and more likely to benefit the country than the efforts made to induce a larger development of the products of the soil." * * * "To enumerate all the details of this great movement is beyond the scope of this article, but the policy of the Government is fixed and settled, and is destined to secure the permanent prosperity of the Republic."[1]

[1] Mexican *Financier* of May 12, 1883.

IV.

## FOREST WEALTH.

### At Isthmus of Tehuantepec.

AFTER reporting upon various natural products of the Isthmus, Williams says: "But among all these productions the timber of its immense forests deserves particular mention. Its abundance is such that the only limit which can be assigned to the supply it may yield is the demand for centuries to come. From the fir, the oak, the cedar, and every description of building timber, to the dye and fine woods, their profusion is absolutely incredible. None of the countries which at present supply these species of woods could compete with the Isthmus, where they are found on the very banks of the river which facilitate their carriage."[1]

The great variety of valuable timber and fine woods may be seen from the enumeration in Shufeldt's survey, as follows: "In the Chimalapa region, along the banks of the upper Coatzacoalcos and the Rio Blanco, white pine, pitch pine, white oak, cypress, mammee-sapote, and chico-sapote abound." * * * "On the Atlantic plains mahogany, cedar, macaya, guapaque, mammee-sapote, and piqui, or iron wood, are abundant." * * * "On the Pacific plains lignum-vitæ, rosewood, calabash, and ebony are the most common."[2]

Robert Dale, who visited the Isthmus about 1850, and has since published, in London, a book on the excursion, says: "We found the mahogany trees very plentiful, growing generally from fifty to two hundred feet apart; many of them were of great girth, say from eighteen to twenty-four feet in circumference, and as high as fifty or even sixty feet without branches, when they threw out large arms, often thickly covered with parasitical plants and flowers, and with vines hanging down from them. Here we saw a raft of one hundred logs on the river, besides other trees which were cut in the forests ready for removal. A good many of them, very sound and free from defects, were well squared, and about three feet deep."[3]

A work on the mahogany tree by Messrs Chaloner and Fleming, of

[1] Barnard & Williams' Survey, p. 140. [2] Shufeldt's Survey, pp. 121–2.
[3] Notes of an Excursion to the Isthmus of Tehuantepec, by Robert Dale, p. 34.

Liverpool, is authority for the following: "The first mention of it occurs shortly after the discovery of the New World, when Cortez and his companions, between the years 1521 and 1540, employed it in the construction of the ships which they built for prosecuting their voyages of discovery after their conquest of Mexico."[1] If these writers are correct in this historical point, it is likely the mahogany for these ships was cut at the Isthmus; for a part of Cortez's expedition to the South Sea was fitted out at the port of Tehuantepec, or his own port, as it is called.

The imports of mahogany by Great Britain during the ten years ending 1879 were in value $22,200,102, or $2,220,000 annually.[2]

Of the varieties of fancy woods such as we have above stated grow upon the Isthmus, the United States imported from various sources during the year ending June 30, 1883, as follows, in value:[3]

| | |
|---|---|
| Mahogany | $569,412 |
| Cedar | 330,962 |
| Rose | 260,757 |
| Ebony | 72,344 |
| Lignum-vitæ | 60,839 |

Whoever makes the business connection between the enormous supply of these valuable timbers to be found in the great forests of the Isthmus, and the steady demand existing in Great Britain, the United States, and other countries, may feel assured of large returns. But the above does not comprise the whole list. Williams' report states that the India-rubber trees are "found in astonishing numbers throughout the forests that skirt the tributary streams," and adds: "Taking half the number of trees found within an area of one-fourth of a square mile on the Uspanapa river as a basis of an estimate, and allowing none to grow on the Pacific plains, there would be found not less than two millions of India-rubber trees within the limits of the Isthmus, some of which yield four and five pounds of gum in a year. If, from this prodigious number of trees, we suppose *one-half* only to be available, and that a single pound per tree per annum be the average yield, we should then have one million of pounds, which, at the present value of forty cents, would realize the sum of $400,000 for this article alone."[4]

In this connection it is important to observe that the United States alone during the fiscal year ending June 30, 1883, imported India-rub-

[1] "The Mahogany Tree," by Chaloner and Fleming, of Liverpool, p. 37.

[2] Statistical Abstract of United Kingdom, No. 27, pp. 48–9.

[3] Commerce and Navigation for 1883, p. 568.

[4] Barnard & Williams' Survey, pp. 183–4.

ber and gutta-percha crude to the enormous extent of $15,511,066 in value. More than half of this was imported from Brazil. As Mexico is nearer and easily accessible, there is no reason why it should not supply a large portion of this demand.

## In Northern Mexico.

A very extensive forest, chiefly pine, extends over large portions of the States of Chihuahua and Durango. In the report of the preliminary survey of the American and Mexican Pacific Railway, which line intersects this forest, we find the following, by Mr. Simmons, one of the party:

"At an elevation of 4,000 feet on the western slope we entered a magnificent belt of pines, and never left it till we descended to 7,000 feet on the eastern side. From the highest elevations, as far as the eye could reach, to the north and south, one sea of pines extended. There is wood enough along our line to supply ties for all the railroads in Mexico, and several parties approached us on the subject of contracting to deliver them at very reasonable prices. Besides the pine there were magnificent oaks of various kinds, and in the foot-hills below the pine not less than twenty varieties of useful woods in great abundance."

Mr. Price, another member of the party, reports: "The foot-hills are covered with timber of various kinds, most of the trees being large enough for railroad ties. At an altitude of 4,000 feet pines begin to grow, and the entire Sierra Madre range is covered with a forest, through which we travelled for days. There is timber enough in the mountains of Mexico to supply this continent for years to come."

Mr. Holbrook, the engineer who recently located the mountain section of the road, says in his report:

"Pine timber commences at Bachochic, a point on the Rio Conchos, 40 miles west from Monoava and 70 miles east of the continental divide, at an elevation of 6,500 feet. It extends across the mountains westward for 200 miles (along the line) to near the mouth of the Rio Sententrion, and indefinitely to the northward and southward. It is the native Rocky Mountain pitch pine, the same as found in Colorado, New Mexico, and Arizona. It is rarely found much below an elevation of 7,000 feet."

General LeDuc, late United States Commissioner of Agriculture, who has recently reported upon the branch line of the same road, extending north and south through the State of Sinaloa, says:

"In the second belt, the coffee, rubber, and other trees requiring

similar conditions, besides mahogany, rosewood, ebony, and chinchona, and in the third belt, on the mountains, at an elevation of 3,000 to 5,000 feet, ash, oak, pine, and cedar will be found."

* * * * * * * *

"South of Mazatlan, toward Tepic, the valuable hardwood trees attain greater size and are very abundant, as I am credibly and particularly informed by the engineer in charge of the coast canal, Mr. E. S. Thurston, of Mazatlan, who is familiar with the coast country from Mazatlan to San Blas and to Tepic. He says the coast forests are boundless, the timber excellent and much of the most valuable varieties known, such as rosewood, mahogany, and a great number of other beautiful hardwoods (much sought after in cabinet or car work) and dye woods; these latter are shipped in great quantity indeed, and form a considerable article of export." * * * "The forest between the rivers Acoponita and Santiago is almost entirely of valuable woods, such as mahogany, cedar, rosewood; palo pinita campinoli (the most valuable timber on this coast) brings thirty shillings a cubic foot in England. This timber weighs as much as marble to the cubic foot. Palo maria margarita, (very hard, deeper color than mahogany, beautiful grain, like hard pine;) mangle, colorado, tepepeate, and other valuable woods are found and in abundance, of large size; cedars grow four to seven feet in diameter, and hardwoods two feet; trees not brush, as on the coast lands north of Mazatlan. Rubber trees are numerous, but little cared for, though a small business is done here in collecting the gum."

## In Central Mexico.

In the report of Mr. Buchanan, chief engineer of the Mexican National Railway, dated April 13, 1882, is the following: "In Michoacan, beyond Morelia, I rode for 150 miles through or near large timber. There was evidently enough to supply the capital and Central and Northern Mexico for a long time."

Near the eastern boundary of the State of Colima is another forest, briefly mentioned in the recent report by Mr. Tonner, vice-president of the Colima Coffee Company. He says:

"The altitude of the valley is three thousand feet, surrounded on three sides by mountains from four to five thousand feet high, and these are wooded to the top with white oak, mahogany, rosewood, rose morado, granadia or satinwood, with capalcha or native cinchona, used by the natives in fever beneficially."

## Importance of the Subject.

Unfortunately for the purposes of this brief, foresty, statistics are almost unknown in the official reports of Mexico. But the elaborate special census bulletins on forestry in the United States have attracted public attention in that country, and it is editorially urged by the *Mexican Financier* that their Government take similar steps to secure official information on this important source of national wealth.

Were the facts now accessible it would doubtless be found that the stray notes above given embrace but a portion of the forest wealth of that country.

The very great importance of the subject may be seen by a glance at the record of the principal industries of the United States during the census year 1880. The lumber products were as follows in value: Sawed lumber, $233,268,729; planed lumber, $36,803,356.

V.

## MARINE WEALTH.

THE marine wealth of Mexico is apparently chiefly concentrated in and around the coast of Lower California and in the Gulf of California, sometimes called "Sea of Cortez," and again "Vermilion Sea." It bears the name of Cortez for the reason that soon after he consummated the conquest of the City of Mexico he visited its waters, and it is called "Vermilion Sea" because mineral waters of vermilion-red are found near its northern shores. About 1867, J. Ross Browne, the first United States Commissioner of Mining Statistics, organized an expedition to visit Lower California. He was accompanied by Wm. M. Gabb, of the State Geological Survey of California, and other experts. Their reports, together with an elaborate "Sketch of the Settlement and Exploration of Lower California," by A. S. Taylor, are published in the appendix of his work on the "Resources of the Pacific Slope," and in them we find almost marvellous statements in regard to the natural riches of the surrounding waters.

### Abundance and Variety of Fish.

On this subject Mr. Taylor gives the following interesting facts:

"Having in the preceding notices given a sketch of the seashores and islands, and of the succession and precession of discoveries and navigations of Baja California, from the earliest records in 1532 to the present, (1867,) we shall now touch summarily on the extraordinary and wonderful wealth of animal life of its marine waters. From all the accounts, histories, and voyages we have quoted, and from the uniform testimony of those more recently who have personally had knowledge of these matters since the discovery of gold in Upper California, it would appear to excel any portion of the world in the wondrous fertility of its fisheries. As early as 1537 and 1539 the infinite number of whales, seals, and fur-otters, of numberless varieties, were noted by Ulloa, who first completely navigated the shores of the peninsula from the mouth of the Colorado to Cape San Lucas, and thence on the ocean coast up to Cedros Island. Then all kinds of shell-fish, or mollusca, and of crustacea, such as lobsters, crabs, crawfish, etc., number by the thousand of species

and all in great abundance, and of excellent edible qualities, as well as of the family of turtles. The proper family of fishes of all known genera are found in every bay and harbor in such extraordinary quantities, and of such excellent dietetic qualities, as to have been remarked by every navigator or writer we have mentioned or read of, and it is to the present time a matter of wonder to every visitor to Lower California. Except the mollusca, cetacea, and phocidea, this great field of nature has been but little explored by the naturalist, leaving in the true fishes vast numbers to be yet added to the stores of science and human utility. Many of the fishes and shells are not only very curious, but of extraordinary beauty, and highly prized by connoisseurs." * * *

"In 1860–'62 Mr. John Xantus, a naturalist of great ability and enterprise, who had served in many of the recent Government overland explorations of rail and wagon roads, was employed by Prof. Bache, the director of the United States Coast Survey, to make observations on the tidal phenomena of the California seas below the parallel of Magdalena Bay. In connection with his investigations he employed much time in natural history collections of the southern part of Lower California for the Smithsonian Institute, which numbered over 100,000 specimens of different animals, plants, and minerals, of which some 30,000 were of fishes, shells, crustacea, sponges, star-fishes, and corals; about one-half of these specimens were entirely new to science. This was the largest collection ever made in the fauna and flora of those or any other parts of the peninsula explored by him, leaving out, as entirely unexamined by any one, *two-thirds of the country to the north of* 24°, and was duly forwarded to the Smithsonian Museum at Washington. Of the fishes he collected 800 distinct species; of crustacea, such as crabs, etc., he collected 800 species; of radiata or star-fishes, 40 species; of shells, 4,000 species; of corals, 8 species, and of sponges 14 species; of these inhabitants of salt water fully two-thirds are said *never* to have been before examined or noted in science. It is, therefore, evident that the fisheries of this country are to become a world of wondrous wealth to its future inhabitants—of incalculable benefit to the laboring classes in reducing the cost of living and rendering them independent of the cruel exactions of capital or the fickle whirls of commercial prosperity or depressions."[1]

Further testimony to the same effect may be found in the report of Wm. M. Gabb, of the State Geological Survey of California, who accom-

[1] Resources of the Pacific Slope, by J. Ross Browne, p. 48 of Appendix.

panied J. Ross Browne's expedition to Lower California in 1867. He says: "Shoals of fish frequent these shores in such abundance that the surface is often agitated for hundreds of yards by a school playing almost within arms' reach of the sands. On either coast there are countless spots where fisheries could be established with all the facilities of a good beach and excellent port and unlimited quantities of salt."[1]

## Oyster Fisheries.

On this point Mr. Taylor says: "There can be no doubt that the finest varieties of our edible oysters could be bred and cultivated to supply all the Pacific domain forever." * * * "There are doubtless many extensive beds never fished or even discovered in these little-known seas, as is the habit of the oyster family, and there is every likelihood they could be cultivated and increased as are the oysteries of Long Island and the Potomac, or of France and England."[2]

## Pearl Fisheries.

On this subject Mr. Taylor says:

"Pearl oysters are not found everywhere on the coast, but intercalate at intervals, preferring well-sheltered bays or harbors, where fresh water empties; but this rule is not invariable. They are met with for over 1,000 miles of shore line between Magdalena and around the Cape, and all the way up the Gulf, north above Angel Guardian Island, and the missionary writers state that after hurricanes they are known to have been thrown up on the beaches by the car-load." * * * "Ordinary pearls are always abundant every year, but extraordinary sizes and colors are very rare. The most splendid of the pearls in the Spanish *regalia* were brought from the Gulf of California before Napoleon's invasion, and they had always been in high demand in Spain since the days of Cortez. An American minister, in 1863, says that some of these pearls were as large as pigeons' eggs, and were among the most valuable jewels in the crown regalia."[3]

Mr. Gabb says in his report to J. Ross Browne:

"Pearl-fishing has been for over a hundred years a regular business and one of the most profitable in Lower California. It is estimated that in the last century and a half upward of five and a half million dollars

[1] Resources of the Pacific Slope, by J. Ross Browne, p. 121 of Appendix.
[2] Ditto, pp. 49 and 62.
[3] Sketch of Settlement and Exploration of Lower California, pp. 62, 63.

worth of pearls and pearl-shells have been taken in the California waters."[1]

In a recent official report (1883) from Lower California by United States Consul Viosca, we find the following:

"The present ending season for pearl-diving has been very prosperous. Three pearls of special note have been obtained by the following divers:

"One pearl of light brownish color and of dark shading, weighing 65 carats, the estimated value being $8,000, was found by Manuel Urbano, bought and sent to Paris by Messrs. Gonzalez & Ruffo.

"One pearl of pear shape, and natural pearl color with some dark specks, weighing 44 carats, the estimated value being $7,500, was found by Napoleon Savin, bought and sent to Paris by Messrs. Pablo, Hidalgo & Co.

"One pearl of oval shape, light sandy color, perfect and very brilliant, weighing 32 carats, the estimated value being $5,500, was found by Enrique Savin, bought and sent to Paris by Messrs. Pablo, Hidalgo & Co.

"Pearl-fishing is one of the most important branches of territorial industry, supporting nearly one-quarter of the inhabitants."

## Whale Fisheries.

In another part of the appendix of Mr. Browne's work we find the following:

"Along the coasts, especially on the Pacific sides, the whale fishery is an important interest. Most of the large bays, more particularly Magdalena, and Scammon's and San Ignacio lagoons, are visited by vessels year after year in search of whales, which frequent these waters probably for breeding. There are perhaps as many as from 12 to 20 vessels engaged in this branch of enterprise."[2]

Mr. Taylor says on the same subject: "The waters of Lower California abound with some of the grandest and largest of marine vertebrata and mammalia. There are some ten species of whales, or the cetacea, among which is the sperm whale, which, forty years ago, were numerous between the Santa Barbara Islands and Cape San Lucas, and made the fortunes of hundreds of ships." * * * "In some years there are reported to have been not less than thirty different whaling and sealing camps below San Diego, aggregating some 2,000 men."[3]

[1] Resources of the Pacific Slope, by J. Ross Browne, p. 121 of Appendix.
[2] Ditto, 638. [3] Ditto, p. 60 of Appendix.

## Seal Fisheries.

Mr. Gabb says in his report: "Besides the whale fisheries the whole Pacific side of the peninsula furnishes unusual facilities for seal hunters."[1] Another writer says in the appendix of this work: "Seal fishing has also attracted some little attention, though not as much as it merits."[2]

## Turtle Fisheries.

Mr. Taylor says: "The real tortoise-shell turtle is also found on both coasts of the peninsula, and the different species of the edible turtle are particularly abundant, and, in many places, so easy of access as to be had for the trouble of capture and are frequently brought to San Francisco."[3]

## Salt Deposits.

It would perhaps be more strictly correct to place salt in the mining chapter, but as a large portion of the deposits are on the islands and coasts of the sea, and have a direct bearing upon the development of the fishing industry, we will briefly consider the subject in this connection. Mr. Taylor says: "The salinas of the ocean coast from San Quintin to Magdalena are very numerous and plentiful and the salt is easily gathered. The salt mines of Carmen Island are said to be sufficiently extensive to supply the whole world, and large quantities of salt have been sent to San Francisco during the last ten years, as it is very dry, pure, and of the primest quality, and is taken out only a short distance from ship anchorage. Before 1750 the Jesuits offered to the viceroy to entirely support the California missions if this deposit were granted to them by the king of Spain, but the offer was declined. For the last few years the Mexican Government has raised considerable revenues from farming out this salt mine."[4]

Salt is also found on the eastern coast of Mexico in a chain of lagoons in the State of Tamaulipas.

In the interior of the country it is found in many places, but as those mines are not part of the marine wealth we will omit them from this enumeration.

[1] Resources of the Pacific Slope, by J. Ross Browne, p. 121 of Appendix.
[2] Ditto. 638. [3] Ditto, p. 49 of Appenpix. [4] Ditto, p. 59 of Appendix.

## Guano Islands.

In Mr. Taylor's work is the following mention of guano deposits in the Gulf of California: "There are stated to be guano deposits on several of the islets and rocks of the upper gulf sections, where myriads of sea-fowl congregate; and, as rains are infrequent there, the quality is doubtless profitable to work. From 1855 to 1857 great excitement was created in San Francisco touching the deposits on the ocean coast of the peninsula and the little island of Elide, so called, as we are informed by Captain Kimberly, of Santa Barbara, from an American vessel, which first took a cargo, was the centre of some spicy events for many months. The island is said to have yielded many large cargoes for several years, gaining several hundred thousand dollars, by a few long-headed speculators, but at present we believe it is exhausted. Growing out of this discovery, some active California traders started off to Mexico, and are said to have secured a monopoly of all guano deposits on both coasts of Lower California, the result of which was the establishment of the well-known Mexican Guano Company of San Francisco. Elide Island is in the northern part of Viscaino Bay, in about 28° 50′, and some 50 miles northeast of Cedros Island, and at Natividad and Assumption Islands, below Cedros, guano is also said to be found, as well as on several other islets and points further south."[1]

Very recently a new concession has been granted by the Mexican Government for the working of the guano deposits on the Pacific coast of that country. From information derived from parties interested we are led to believe that there are several islands still containing guano. One which has recently been examined has a deposit at least six feet deep and covering an area 1,300 feet long by 600 feet broad.

The facts about some eleven other islands in the Gulf of California will doubtless be accessible as soon as the company mentioned make the necessary examinations.

[1] Ditto, p. 64 of Appendix.

VI.

## MANUFACTURES.

THE manufacturing industries of Mexico are still in their infancy. Perhaps it would be more accurate to say that most are yet unborn.

Raw material of nearly all kinds can be produced there in profusion. There is water-power in abundance in many parts of the Republic, and, unlike that of New England and other Northern countries, it is never interrupted by ice in the winter season. Labor is cheap, and the necessity and demand for manufactured articles are great. But the supply comes chiefly from aboard.

There are many indications that the new era of development and progress which has dawned upon that country and is supplying it with transportation facilities will soon witness a rapid growth of manufactures.

In a recent communication to the State Department United States Consul-General Strother writes:

"The Government is also especially solicitous and liberal in its efforts to establish and cherish home manufactures of all kinds, and the facilities of transportation afforded by the new railroad lines and new lines of steamships recently started has greatly encouraged the investment of domestic and foreign capital in new manufacturing enterprises. A number of patents have already been granted by the Government to American citizens for new machines and improved methods for making available the numerous and varied natural products of the soil and climate, which have hitherto grown useless and neglected for lack of knowledge and scientific methods for their treatment. In brief, there is no branch of the natural wealth of this country which is not at this period attracting more or less interest and practical attention."

But there is one notable exception to the above which we will briefly describe.

### Cotton and Woollen.

The official statistics[1] for the last attainable year show that Mexico has 97 cotton and woollen factories, of which about five-sixths in number are cotton. The total value of the buildings and machinery is $5,078,775. The total number of operatives employed is 12,346.

[1] Compiled from Estadistica de la Republica Mexicana, by Emiliano Busto. Mexico: 1880.

The number of factories in each State is as follows:

| | | | |
|---|---|---|---|
| Puebla | 21 | Tlaxcala | 2 |
| Jalisco | 10 | Oaxaca | 2 |
| Federal District | 8 | Colima | 2 |
| Durango | 7 | San Luis Potosi | 1 |
| Coahuila | 7 | Guerrero | 1 |
| Mexico | 6 | Queretaro | 1 |
| Vera Cruz | 5 | Sonora | 1 |
| Guanajuato | 4 | Yucatan | 1 |
| Hidalgo | 4 | Zacatecas | 1 |
| Michoacan | 3 | Aguas Calientes | 1 |
| Sinaloa | 3 | | |
| Chihuahua | 3 | Total | 97 |
| Nuevo Leon | 3 | | |

It will be observed from the above that there are one or more factories in 23 of the total 29 States and territories of the Republic.

## Iron.

Iron furnaces, foundries, rolling-mills, etc., are almost unknown to Mexico. But the extensive deposits of iron ore and coal in various parts of that country, the new demand for steel rails, telegraph wire, farming implements, mining machinery, and the manufactures of iron in very many other forms, will necessarily soon stimulate a development of this industry.

## Silk.

This industry is chiefly in the future, but preliminary steps for its development have already been taken by the Government of Mexico. United States Consul-General Strother, in his report dated December 30, 1882, sends the following enclosure on this subject:

"The Secretary of Public Works has given a concession to José Fulcheri to organize a company under the name of the Mexican Industrial Society, for the purpose of growing the mulberry tree and promoting the raising of the silk-worm in different parts of the Republic. The conditions of the concession require the grantee to erect 20 establishments in places decided upon by the Department of Public Works, and to build immediately in this city, or within the Federal District, a mill provided with the latest improved machinery. The Government, to encourage the development of this kind of industry, here so little known, will give $1,200 annually for the term of ten years to each one of the 20 establish-

ments so founded, and $600, besides the land, to all colonists established to assist in this industry."

## Paper.

On this subject Mr. Strother has recently sent to the State Department a very elaborate and interesting report from which we quote as follows:[1]

"There is probably no country in the world which surpasses Mexico in the abundance and variety of its fibrous plants proper and adaptable to the manufacture of paper, yet the exorbitant cost of this important agent of modern civilization, affecting, as it does, the prices of books, newspapers, and all kinds of printed and written productions, may be regarded as a serious impediment to the general education and enlightenment of the people of the Republic.

"As early as the year 1829, an American named Benfield established a paper mill near the City of Mexico, which is still in prosperous existence.

"There are twelve paper factories now in the Republic, distributed in six different States, and producing an aggregate of about 25,000 pounds daily. This product is chiefly of the commoner qualities of wrapping paper, newspaper sheets, with white and colored sheets for placards and posters. The proportion of the finer qualities of book and writing paper is very small."

* * * * * * *

"The materials used are rags, refuse cotton, waste paper, palm fibre, and 'ixtle,' or maguey fibre, in small quantities.

"About 30 per cent. of the paper consumed in the Republic is of domestic manufacture. The remaining 70 per cent. is imported from France, Germany, Italy, Spain, and the United States."

* * * * * * *

"In reply to inquiries made by certain parties in France relative to the fibrous and textile plants of Mexico available for the manufacture of paper, the Mexican commissioners, appointed by the Government, reported the following:

"1st. The various species of the maguey plant, (the sap of which furnishes the national beverage, pulque,) which grows to gigantic size, and whose leaves contain a quantity of tough fibre which may be readily bleached and converted into paper.

"2d. The varieties of plantain, grown in the warm districts, chiefly for the shade they afford the young coffee plantations, and whose stocks and voluminous leaves furnish a very fine and white fibre in great abundance.

[1] Reports from the Consuls of the United States, No. 27, pp. 58–60.

"3d. Tule, a tough rush, commonly used by the Indians for weaving mats, floor covers, baskets, and chair-bottoms, which is found in unlimited quantities in the fresh-water lagoons in the Valley of Mexico and elsewhere in similar table-lands, and which is very rich in paper-making material.

"4th. The sugar cane, cornstalks, wheat, rye, and barley straw are also available for the same purpose.

"5th. Various plants of the 'Malvacea' family are also worthy of attention, especially the 'alacle,' found in the State of Morelos, whose long, white, and abundant filaments attracted so much notice in the Exhibition of 1876 at Philadelphia.

"6th. The '*Masahual hibiscus*,' abundant on the Gulf coast, and the 'huinare,' very common in the State of Michoacan, with many other plants of the same class, are also worthy of mention.

"7th. There are, besides, numerous plants of the cotton family, the '*Bizuagas mamillaria*,' and the '*Cacteas*,' that cover the mountains of Cardonal, Mezquital, and other localities.

"8th. The 'pochote' (*Eriosendron anfractussum*,) of the family of the 'Bombaceas,' whose seed is enclosed in fine silken filaments resembling cotton.

"9th. The 'cuanlahuac,' (*Heliocarpus americanus*,) of the family of the Tiliaceas, growing in the States of Morelos and Puebla, and whose cortical fibres are remarkable for their beauty.

"10th. Indigenous Urticeas of divers species, such as the common nettle of the Valley of Mexico, *Urtica divica*, besides several species of Bromeliacas, notably the *Bromelia sylvestris* of Tehuantepec.

"11th. The 'pastles' or 'henos,' (Tilandsia,) the izotes of the Siliaceas, extremely abundant in the State of San Luis Potosi and elsewhere on the elevated plains of the interior States.

"12th. Finally, the different species of palms of the Tierras Calientes, especially the hat palm, (Chamacrop's,) which has an exceedingly tough and fine fibre.

"In brief, Mexico, with its wonderful varieties of soil and climate, appears to be the favored home of filamentous and textile plants, many of which grow spontaneously like wild weeds, covering large districts of country, to be had simply for the gathering, while those requiring cultivation with the advantage of cheap lands, cheap labor, and abounding fertility may be produced at prices which defy competition."

In another report, dated December 30, 1882, Mr. Strother sends the following enclosure, which shows that the Mexican Government fully

appreciates the importance of this industry and intends to see it adequately developed:

"Messrs. Louis Legorreta and Arthur Mayer have obtained a concession from the Secretary of Public Works, allowing them for the term of ten years to gather the cactus or *maguey* plant on Government lands or on such lands as they may acquire. Provided the company organized establishes in the country, within two years from the date of the contract, a paper and textile mill, utilizing the leaf of the cactus, the Government will give the company a premium of $30,000 for each mill, said mills to cost not less than $150,000 each. The contract requires one of these mills to be established within the Federal District."

## Silver and Gold.

Baron Humboldt said at the beginning of the present century: "There are few countries in which a more considerable number of large pieces of wrought plate, vases, and church ornaments are annually executed than in Mexico. The smallest towns have gold and silversmiths, in whose shops workmen of all castes, whites, mestizoes, and Indians, are employed. The academy of fine arts and the schools for drawing in Mexico and Xalapa have very much contributed to diffuse a taste for beautiful antique forms. Services of plate to the value of a hundred and fifty or two hundred thousand francs have been lately manufactured at Mexico, which for elegance and fine workmanship may rival the finest work of the kind ever executed in the most civilized parts of Europe."[1]

## Other Manufactures.

In addition to the industries above described it may be mentioned that there are glass factories in the States of Puebla and Mexico, and earthenware establishments in three or more States.[2]

In the Federal District there are a great variety of manufactures, such as clothing, hats, fancy goods, articles for domestic use, etc., amounting to upwards of $15,000,000 annually.[3]

Wheat flour is manufactured in 22 States and territories, the product for the last attainable year being $13,463,833 in value.

The total manufactured products of agriculture in the various States, such as flour, rum, pulque, white and red wines, chocolate, beer, etc, amount in value to about $29,000,000 annually.

[1] New Spain, III, p. 477–8.

[2] The Republic of Mexico in 1876, by Antonio Garcia Cubas, p. 28.

[3] Estadistica de la Republica Mexicana, by Emiliano Busto. Mexico: 1880.

VII.

## COMMERCE.

### Rank among Nations.

ONE would naturally expect that a country having an area equal to that of the German Empire, France, England, Spain, Ireland, Scotland, Greece, and Belgium combined—a seaboard of more than 6,000 statute miles—mineral, agricultural, forest, and marine wealth of all kinds and in the greatest profusion, and a geographical position midway between Europe and Asia and North and South America, would rank very high in foreign commerce. What are the facts?

During the last attainable year the relative rank of those countries, having a total annual foreign commerce (exports and imports of merchandise) of more than $50,000,000 in value, was as follows:[1]

| | | | |
|---|---|---|---|
| 1. Great Britain | $3,370,000,000 | 18. Sweden and Norway | $195,000,000 |
| 2. France | 2,269,000,000 | 19. Spanish West Indies | 152,000,000 |
| 3. Germany | 2,150,000,000 | 20. Asiatic Turkey | 140,000,000 |
| 4. United States | 1,545,000,000 | 21. Straits Settlements | 139,000,000 |
| 5. Russia | 864,000,000 | 22. Dutch India | 116,000,000 |
| 6. Holland | 595,000,000 | 23. Turkey in Europe | 116,000,000 |
| 7. Belgium | 563,000,000 | 24. Denmark | 114,000,000 |
| 8. Austria-Hungary | 553,000,000 | 25. Argentine Republic | 100,000,000 |
| 9. Italy | 504,000,000 | 26. Roumania | 95,000,000 |
| 10. British India | 489,000,000 | 27. Algeria | 94,000,000 |
| 11. Australasia | 254,000,000 | 28. Egypt | 87,000,000 |
| 12. Switzerland | 233,000,000 | 29. Chili | 74,000,000 |
| 13. China | 223,000,000 | 30. Brit. West Indies | 62,000,000 |
| 14. Brit. N. America | 216,000,000 | 31. Portugal | 59,000,000 |
| 15. Brazil | 215,000,000 | 32. Cape Colony | 57,000,000 |
| 16. Hong Kong | 200,000,000 | 33. Japan | 57,000,000 |
| 17. Spain | 197,000,000 | 34. Mexico | 55,000,000 |

This state of affairs is truly astonishing. It is a commercial absurdity. The foreign trade of Mexico is, then, a matter of the future. Why has it been so small in the past? Undoubtedly the lack of transportation routes from the interior to the seaboard has been the principal cause.

[1] Compiled from letter of Secretary of State, transmitting the report on the Commercial Relations of the United States for 1880 and 1881.

Mexico, unlike the United States, has almost no internal water ways. Until recently it has had no railway from the interior to the seaboard. It has but one now, and no completed railway line from its capital to the United States. This great barrier to the development of trade was clearly stated a few years ago by the Mexican Committee on Mining Taxes as follows:

"The central table-land of our country is separated from either sea-coast by rugged mountains and deep ravines, breaking it into longitudinal zones of different temperatures and varied productions; but this fact almost cuts off communication between these zones and the sea-coast east or west. While such natural difficulties exist, increased by territorial extent, manufactures and agriculture cannot thrive, because the cost of transportation is so great we cannot contend with foreign competition, and our vegetable products must be confined to home consumption."[1]

The unwise tax upon interstate commerce has also exerted a depressing influence. Frequent revolutions have placed further barriers in the pathway of commerce. But this last obstacle has, it is confidently believed, been permanently removed. The restrictions upon interstate commerce will soon disappear by the adoption of a constitutional amendment recently submitted to the States. And the early completion of several of the many railways now under way from the interior to the seaboard and to the frontier of the United States will give an impetus to the development of foreign trade, which will soon change Mexico's place among nations from the thirty-fourth position to a much higher rank.

It will be observed that the statistics of the total commerce of Mexico as given in the above table includes simply merchandise. If we add the exports and imports of specie and bullion, which during the last five years have averaged about $22,000,000 annually, the total will be $77,000,000. But it is the present practice of statisticans of nearly all governments to omit coin and bullion when contrasting the commerce of different nations. As a rule this is fair, but in the case of Mexico it may work unfairly for the reason that, unlike most other nations, it *produces* the coin and bullion which it exports.

## Trade with the World.

*What Mexico Sells.*—The total exports of Mexico during the last fiscal year ending July 31, 1883, including both merchandise and the precious metals, amounted to $41,807,595, being nearly $13,000,000 more

[1] Production of the Precious Metals by Blake, p. 318 of Appendix.

than the exports of the year immediately preceding. The items arranged in order of value were as follows:[1]

| | | | |
|---|---|---|---|
| Precious metals | $29,628,657 69 | Honey | $115,817 56 |
| Henequen | 3,311,062 64 | Beans | 90,641 11 |
| Woods | 1,917,323 67 | Chile | 82,205 38 |
| Coffee | 1,717,190 85 | Fruits | 78,898 42 |
| Skins | 1,653,165 92 | Orchilla | 74,628 68 |
| Living animals | 634,376 18 | Copper | 65,996 00 |
| Ixtle | 596,533 23 | Maize | 63,684 11 |
| Vanilla | 443,850 75 | Cerda | 62,007 77 |
| Tobacco | 272,160 18 | Sarsaparilla | 50,699 04 |
| Sugar | 198,365 16 | Other articles | 467,010 28 |
| Caoutchouc | 159,882 92 | | |
| Roots of zacaton | 123,438 01 | | $41,807,595 35 |

*What it Buys.*—The items of the imports of Mexico for the last fiscal year are not at present accessible.

In Mr. Cubas' work on "The Republic of Mexico," published in 1876, he says "the value of importations may be estimated at $29,000,000, in the following form.

| | |
|---|---|
| "Cotton and cotton goods | $10,500,000 |
| Groceries, wines, and spirits | 5,000,000 |
| Articles free of duty | 3,300,000 |
| Hardware and ironmongery | 2,100,000 |
| Miscellaneous | 2,000,000 |
| Linen and hemp goods | 1,400,000 |
| Woolen goods | 1,400,000 |
| Mixed goods | 1,400,000 |
| Silks | 1,000,000 |
| Earthenware, porcelain, glass, and crystal ware | 600,000 |
| Drugs and chemicals | 300,000" |

Since then the relative importance of the various items has changed somewhat, the value of iron, steel, and the manufactures of the same imported from the United States alone during the fiscal year ending June 30, 1881, amounting to $2,360,044.

*Where it Sells.*—The official reports of the Mexican Government for the fiscal year ending July 31, 1883, gives the total exports (merchandise, coin, and bullion) by countries, as follows:

| | | | |
|---|---|---|---|
| England | $17,258,242 | Spain | $1,989,258 |
| United States | 16,739,097 | Germany | 1,125,719 |
| France | 4,204,905 | Colombia | 358,167 |

[1] From Mexican *Financier* of October 27, 1883.

| | | | |
|---|---|---|---|
| Guatemala | $93,561 | Italy | $300 |
| Belgium | 29,040 | Venezuela | 300 |
| San Salvador | 8,803 | Ecuador | 200 |

*Where it Buys.*—Mr. Cubas, in his work above mentioned, published in 1876, gives the imports by countries as follows:

| | | | |
|---|---|---|---|
| England | $10,200,000 | United States of Colombia | $1,200,000 |
| United States | 7,500,000 | Central America | 100,000 |
| France | 4,780,000 | Italy, Belgium, and American Republics | 20,000 |
| Germany | 3,800,000 | | |
| Spain and Cuba | 1,400,000 | | |

Were the statistics of Mexico's imports by countries for the last fiscal year accessible the order above stated would be somewhat different, for its imports of merchandise from the United States during the year ending June 30, 1883, were $16,587,620 in value.

## Trade with the United States.

*Natural Facilities.*—No intention of nature is more clearly indicated than that the principal commercial exchanges between Mexico and the outside world should be with the United States. The table-lands extending from near the City of Mexico to the southern border of the United States, and thence northwardly through New Mexico, are in themselves a natural highway between the two adjoining Republics, for, as Baron Humboldt said many years ago, "four-wheeled wagons can travel from Mexico to Santa Fé." But between the great interior of that country and the ocean on either side intercommunication is usually very difficult. Mexico has in general contour been likened to a cornucopia, and by reference to the map preceding chapter I it will be observed that the comparison is most appropriate. It is, indeed, a *well-filled* cornucopia opening into the United States, and ready to pour into our lap its almost fabulous wealth in precious metals and its abundant and varied supply of tropical products when we complete the necessary transportation facilities penetrating its fertile fields and rich mining districts.

*Reciprocal Free Trade.*—The two countries are in climate, resources, and general characteristics the reverse and complement of each other. The interior of one is highlands—that of the other is valley. One has a comprehensive system of water-ways from the interior to the seaboard—the other very few navigable rivers. One can supply tropical products of every variety in great abundance—the other consumes them to the value of about $200,000,000 annually. One produces sugar in nearly all or 22 of its States and territories—the other consumes it in all of its

47 States and territories, the present annual consumption of imported sugar in the United States being more than two billion (2,000,000,000) pounds, or 37.70 pounds per capita. One can produce an almost unlimited supply of coffee—the other consumes it to the extent of about five hundred million (500,000,000) pounds annually, or 9.52 per capita. One needs railway iron and supplies, farming implements, mining machinery, and a thousand and one articles of modern invention—the other manufactures them and needs new markets for their sale. In brief, the two countries are the complement of each other in supply and demand, and can exchange services to mutual advantage and profit. Look the world over and it would be impossible to find two nations better adapted to or more in need of reciprocal free trade.

Their natural relations are similar to those between England and India and their trade relations should be as intimate and extensive. Mexico should be *our* India in a commercial sense and not that of England France, or Germany—the three nations which now outrank us in valu of annual foreign trade.

Again, other conditions being favorable, commercial interchanges between American sister Republics, particularly adjoining Republics, with similar constitutions and laws, should be nearly as free of restriction commerce between two States of the same country. No Chines should stand in the way of full, free, and friendly intercommunic

## A Statistical Summary.

The official record of the trade between the two Republics during last ten years is as follows in value of merchandise: [1]

| *Year ending June 30—* | *Mexico's imports from the United States.* | *Mexico's exports to the United States.* | *Total.* |
|---|---|---|---|
| 1874 | $5,946,839 | $4,346,364 | $10,29 |
| 1875 | 5,737,282 | 5,174,594 | 10,911 |
| 1876 | 6,200,572 | 5,150,572 | 11,351, |
| 1877 | 5,893,494 | 5,204,264 | 11,097,7 |
| 1878 | 7,460,704 | 5,251,502 | 12,712,206 |
| 1879 | 6,752,244 | 5,493,221 | 12,245,465 |
| 1880 | 7,866,493 | 7,209,593 | 15,076,086 |
| 1881 | 11,171,238 | 8,317,802 | 19,489,040 |
| 1882 | 15,482,582 | 8,461,899 | 23,944,481 |
| 1883 | 16,587,620 | 8,177,123 | 24,764,743 |

[1] Statistical Abstract of the United States, No. 6, p. 47.

The exchanges of gold and silver coin and bullion during the same period were as follows:[1]

| *Year ending June 30—* | *Mexico's imports from the United States.* | *Mexico's exports to the United States.* | *Total.* |
|---|---|---|---|
| 1874 | $57,531 | $8,893,541 | $8,951,072 |
| 1875 | 33,501 | 6,460,389 | 6,493,890 |
| 1876 | 7,600 | 7,355,181 | 7,362,781 |
| 1877 | 5,239 | 10,240,319 | 10,245,558 |
| 1878 | 32,180 | 8,394,146 | 8,426,326 |
| 1879 | 9,040 | 8,554,598 | 8,563,638 |
| 1880 | 3,371 | 9,115,824 | 9,119,195 |
| 1881 | 1,500 | 9,136,324 | 9,137,824 |
| 1882 | 18,446 | 6,631,938 | 6,650,384 |
| 1883 | 96,964 | 9,782,986 | 9,879,950 |

As was observed on a previous page, Mexico's exports of the precious metals, unlike those of most other nations, are the products of its own soil, and a portion at least might with propriety be added to its exports of merchandise.

It will be observed from a glance at the above table of exports and imports of merchandise that Mexico's imports from the United States have more than doubled during the last three years. This is, indeed, more than a fulfilment of the prophecy of the United States Secretary of Legation, who said in some official comments on the commerce between the Mexican countries during 1880:"[2]

"It is not too much to assume, under normally favorable circumstances, that the imports of Mexico in the next five years will be double their present proportions. It then becomes a question of much importance also what extent the United States will partake in this trade. Taking into account the community of political and conterminal feeling which should cement the American people of both Republics, as well as the further fact that the capital and best intellect of the United States are at the service of Mexico for the development of its natural resources, as well as for the building up of its manufactures, it is not too much to assert that one-half the whole trade of that country should be with this

[1] Statistical Abstract of the United States, No. 6, p. 60.

[2] Letter of Secretary of State transmitting report on Commercial Relations of the United States for 1880 and 1881, p. 71.

Republic. Of course, as corollary to this assertion, we must supply Mexican wants with manufactures at least equally as good, and at as low rates, as can be supplied and given by Europe; we must accommodate ourselves to the tastes and habits of the people, give as favorable terms as can be given by others, and in all respects complying with the very best principles of international trade, as if we had to contend against geographical, political, and national prejudices."

Bearing in mind that the gratifying increase above mentioned occurred during the three years preceding the completion of the first international railway to the City of Mexico, it is not unreasonable to presume Mexico will again double its imports from the United States during the three years following the 5th of May, the date fixed for celebrating the completion of the Mexican Central Railway from the United States to the City of Mexico.

*What Mexico Buys.*—The leading items of imports of domestic merchandise from the United States by Mexico during the fiscal year ending June 30, 1883, are in value as follows:[1]

| | |
|---|---|
| Iron and steel and their manufactures | $3,395,528 |
| Cotton and its manufactures | 3,135,849 |
| Wood and its manufactures | 1,385,420 |
| Cars, freight and passenger | 717,277 |
| Horses, mules, and sheep | 480,958 |
| Gunpowder and other ammunition | 423,491 |
| Quicksilver | 394,572 |
| Indian corn | 391,751 |
| Drugs, chemicals, medicines, and fancy articles | 365,665 |
| Sewing-machines | 312,854 |
| Mineral oils, crude and manufactured | 270,948 |
| Butter, lard, cheese, and tallow | 248,184 |

*What it Sells.*—The leading items of exports from Mexico to the United States during the fiscal year ending June 30, 1883, are in value as follows:[2]

| | |
|---|---|
| Gold and silver coin and bullion | $9,782,986 |
| Raw jute and other grasses | 2,712,088 |
| Hides and skins | 1,568,645 |
| Coffee | 809,757 |
| Live animals | 661,245 |
| Wood, unmanufactured | 442,257 |
| Dye woods | 211,714 |

[1] Compiled from Commerce and Navigation for 1883. [2] Ditto.

| | |
|---|---|
| India-rubber and gutter-percha, crude | $123,484 |
| Fruits and nuts | 86,191 |
| Gums | 67,479 |
| Sugar | 63,419 |
| Precious stones | 56,176 |
| Horse-hair and hair of all kinds | 52,885 |
| Tobacco and cigars | 46,133 |

*Future Trade and Rank.*—Minister Romero, while Secretary of the Treasury of Mexico in 1879, said in an elaborate review of the condition of that country and its commercial relations with the United States:[1]

"If, by the increase of the mineral production of this country, the exportation of the precious metals should be increased to $100,000,000 per year, and if, by the increase of agricultural production, there should be exported of coffee alone $50,000,000, and as much more of sugar, the importation of foreign merchandise, instead of being nearly $30,000,000, as it is now, would rise to the sum of $200,000,000 per year, assuming proportions which, although they may appear fabulous now, are, in reality, in nowise exaggerated."

In other words, he estimated the value of the principal branches of the future commerce of Mexico as follows:

| | |
|---|---|
| Exports of precious metals | $100,000,000 |
| Exports of sugar and coffee | 100,000,000 |
| Imports of merchandise | 200,000,000 |
| Total | $400,000,000 |

It will be observed that he mentions but two items of exports of merchandise, whereas if he had included henequen, hides, and skins, tropical fruits, india-rubber, hard woods, etc., etc., the total future exports and imports of merchandise alone might with propriety have been estimated at $400,000,000, or, including precious metals, $500,000,000.

We believe this to be a moderate estimate of the total foreign trade of Mexico in the early future, and to test its fairness let us for a moment refer to the commercial rank of the thirty-four principal countries of the world as given in the table at the head of this chapter. It will be seen that Italy ranks ninth and Mexico thirty-fourth in total annual exports and imports of merchandise.

The mainland of Italy and its two islands, Sicily and Sardinia, have an area of about 118,000 square miles, or less than 16 per cent. that of

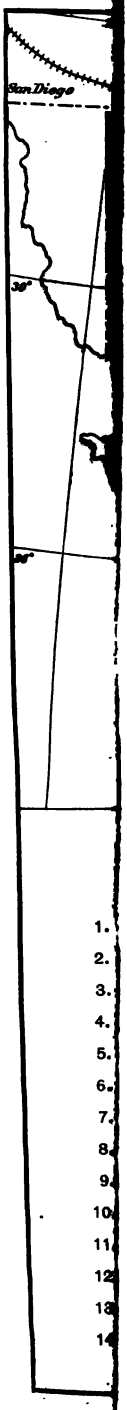
[1] Report of the Secretary of Finance of the United States of Mexico of the 15th of January, 1879, on the actual condition of Mexico and the increase of commerce with the United States, p. 159.

Mexico. The geographical position of the one country in the European Mediterranean is similar to that of the other around the Gulf of Mexico or American Mediterranean. Their climates and capacity for certain tropical products are similar. In mineral wealth and general agricultural capacity Mexico is doubtless far superior. The material development of Mexico will, in rapidity and brilliancy, soon eclipse the public works of the Roman Empire. And in the race for commercial supremacy we believe Mexico will soon outrank Italy, which has a present annual foreign trade of about $500,000,000. In that event Mexico will then rank ninth instead of thirty-fourth among the nations of the world, and we see no reason why it should not go three degrees higher and outrank Holland, Belgium, and Austria-Hungary.

In addition to the net-work of railways which are under construction in all parts of Mexico, it has recently inaugurated a new merchant marine, and is in other respects introducing the best appliances of modern civilization and progress.

The world, ancient or modern, has never witnessed a better planned and more comprehensive system of public improvements than Mexico is now pushing forward to completion, nor has history ever recorded a development more brilliant.

As President Gonzales well said in his message to the Mexican Congress in September, 1882, "If, as there is no reason to doubt, the good and practical sense of the people will not allow them to stray, and succeeding administrations continue on the same path of progress with the same faith and with greater elements, it may not be too much to predict that the coming generation—to-day scarcely able to attend school or to pronounce the name of the country—will celebrate in 1921 the first century of our independence with the same just pride as did our neighbors of the North in 1876."


San Diego
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VIII.

# RAILWAYS.

## Necessity for their Construction.

IN the palmy days of the Roman Empire good public highways were considered indispensable to the welfare of the State. Gibbon, in describing its magnificent system of military roads, says: "No country was considered subdued till it had been rendered pervious to the arms and authority of the conqueror."[1] The victories of peace, as well as war, require the same aids for their advancement. At the present stage of civilization the nation which neglects to supply its territory with suitable roads will be slow in its material development, and will fall behind in the race for commercial supremacy. Civilization, commerce, and railways go hand in hand and are interdependent.

Mexico is no exception to this fundamental rule. Its progress has been slow for want of transportation routes to the seaboard and to the frontier of the United States.

It not only requires good roads, but roads of modern invention, the railways so indispensable for the uses of modern civilization and material progress. It needs them more than the United States and most other nations for the reason that it has almost no navigable rivers, and can have but few canals. In the United States the Mississippi and its 42 commercial tributaries intersect the great interior, are navigable to the extent of 15,710 miles, and supply water transportation to the seaboard for 21 States and Territories.[2] It also has many other navigable rivers flowing to the Gulf, Atlantic, and Pacific seaboards, and canals to the extent of about 4,000 miles. The interior of France, England, Germany, Russia, Brazil, and other nations are supplied with natural or artificial water-ways, but Mexico, because of its peculiar formation, which is about three-fourths table-land, is deficient in this respect. The few navigable rivers it has—probably not more than 1,500 or 2,000 miles in all—are navigable but a short distance from the coast. Hence the pressing necessity for railway transportation.

[1] Gibbon's Rome, I, p. 63.

[2] The Mississippi and Tributaries, by Alex. D. Anderson, pp. 17–18.

## Mileage Required.

The total mileage of inland transportation routes of the two Republics at the beginning of the present year (January 1, 1884) was about as follows:

| | *United States.* | *Mexico.* |
|---|---|---|
| Railways | 120,000 | 3,000 |
| Navigable rivers | 25,000 | 2,000 |
| Canals | 4,000 | 0 |
| Total | 149,000 | 5,000 |

Mexico, to be on a level with the United States in this respect, should have the following mileage of interior transportation routes, viz:

From the stand-point of area which is 25 per cent. that of the United States, 37,250 miles, all but about 2,000 of which must be railways.

From the stand-point of population which is $19\frac{7}{10}$ per cent. that of the United States, 29,353 miles, all but about 2,000 of which must be railways.

From the stand-point of natural resources and capabilities, which are as great in proportion to area as those of the United States, 37,250 miles, all but about 2,000 of which must be railways.

## Facilities for Construction and Operation.

On the table-lands of the interior the natural facilities for the construction of railways are good, as may be seen from the following comments by Baron Humboldt:

"Carriages may run from Mexico to Santa Fé in an extent which exceeds the length which the chain of the Alps would have, if it was prolonged without interruption, from Geneva to the shores of the Black Sea. In fact, the central table-land is travelled in four-wheeled carriages in all directions from the capital to Guanaxuato, Durango, Chihuahua, Valladolid, Guadalaxara, and Perote."[1]

As the table-lands extend throughout nearly the whole length of that country from near the Isthmus of Tehuantepec northwardly to the southern border of the United States, and thence either continue through New Mexico or gently decline and disappear in the plains of Texas, it follows that nature has provided Mexico with easy grades for the construction of its most important railways, which are those connecting its interior with the United States.

[1] New Spain, IV, pp. 2 and 3.

On the lowlands also extending northwardly from the Isthmus of Tehuantepec along both the Gulf and Pacific coasts to the United States the grades are generally easy.

Between the interior and the seaboard on the east and west the grades are usually difficult.

There are, however, other natural advantages applicable to Mexico considered as a whole. We refer to the dry climate and absence of blockading snows.

The United States Secretary of War in transmitting to Congress in 1855 the voluminous reports on the various Pacific Railway surveys and explorations west of the Mississippi river, expressed a decided preference for the most southern route—that along the thirty-second parallel of latitude. Among his reasons for this preference are the following, which may, with equal propriety, be applied to Mexico. He said:

"With regard to the circumstances which affect the cost of working and maintaining the road, they are more favorable than on any other route. In this dry climate the decay of cross-ties and other timber would be very slow, and the absence of severe frost would have a most important influence upon the permanence of the road-bed, and heavier grades could be adopted than in a climate where ice and snow prevail.

"The snows on all the other routes, except that of the thirty-fifth parallel, could not fail, at certain seasons, to suspend the working of the road, for on all such snows are known to have fallen as would interpose an effectual barrier to the passage of trains."

Mexico is exempt from the difficulties here described as existing in more northern latitudes.

## List of Concessions.

The following abstract of railway charters granted by the Federal Government of Mexico up to January 1st, 1883, and in force at said date, was specially prepared for this publication by Robert B. Gorsuch, a civil engineer of the City of Mexico, who has for many years past been prominently identified with the new railway development of that Republic:

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1867. | | | | |
| *Nov.* 27. Vera Cruz to City of Mexico, with branch to Puebla; States of Vera Cruz, Mexico, and Puebla. | Standard. | 263 | $560,000 per annum for 20 y'rs. | $14,000,000 |
| 1874. | | | | |
| *Apr.* 10. Progresso to City of Merida, State of Yucatan. | .....do ..... | 28 | 9,660 | 270,000 |
| *Dec.* 14. Tehuantepec railroad, Isthmus of Tehuantepec, State of Oaxaca. (This charter was declared forfeited, and construction of road undertaken by the Mexican Government on its own account. Contract entered into for same with Sr. D. Sanchez on October 5, 1882.) | .....do..... | 192 | | |
| 1875. | | | | |
| *May* 4. Vera Cruz to Zamorana, State of Vera Cruz. | .....do..... | 24 | 8,050 | 140,000 |
| 1878. | | | | |
| *Feb.* 14. Navigable point on River Panuco, above Tampico, to San Luis Potosi, through the States of Tamaulipas and San Luis Potosi. | Narrow.... | 198 | 12,880 | 2,560,000 |
| 1878. | | | | |
| *Mar.* 26. Vera Cruz to Alvarado, and from River San Juan to Isthmus of Tehuantepec, in State of Vera Cruz. | Not fixed. | 118 | 12,880 | 1,520,000 |
| *Mar.* 28. Merida to Tekax and Peto, State of Yucatan. | Narrow.... | 93 | 12,880 | 1,200,000 |
| *Apr.* 16. Mexico to Morelos and River Amacusac, with branch to Cuernavaca, States of Mexico and Morelos. | .....do..... | 130 | 12,880 | 1,680,000 |
| *May* 6. Puebla to Izucar de Matamoros, State of Puebla. | .....do..... | 37 | 12,880 | 480,000 |
| 1880. | | | | |
| *Aug.* 16. Culiacan and Altata, to connect with Central Railroad from | .....do..... | 99 | 12,880 | 1,280,000 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1880. | | | | |
| Durango, through States of Sinaloa and Durango. | | | | |
| *Sept.* 6. Jalapa to San Andréas Chalchicomula, States of Vera Cruz and Puebla. | Standard. | 18 | $12,880 | $240,000 |
| *Sept.* 8. Mexican Central Railroad Company's charter. City of Mexico to El Paso, with branch to Pacific, through the States of Mexico, Hidalgo, Queretaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Durango, Sinaloa, and Chihuahua. Distance on which to receive subsistence is fixed. | .....do..... | 1,767 | 15,295 | 27,075,000 |
| *Sept.* 13. Palmer and Sullivan grant or Mexican National Cons. Co., City of Mexico to Laredo and to Manzanillo, through the States of Mexico, Michoacan, Guanajuato, San Luis Potosi, and Nuevo Leon. Line from City of Mexico to Pacific. | Narrow.... | 540 | 12,075 | 6,525,000 |
| Line from junction to Laredo.... | ..... | 698 | 10,465 | 7,312,500 |
| *Sept.* 14. City of Puebla to San Marcos. | Narrow.... | 37 | 12,880 | 480,000 |
| *Sept.* 14. Sonora Railroad. Guaymas to frontier, with branch to Alamos, State of Sonora. | Standard. | 514 | 12,075 | 6,225,000 |
| *Sept.* 14. Merida to Calkini and Celesturo, State of Yucatan. | Narrow.... | 102 | 12,880 | 1,320,000 |
| *Nov.* 27. Connection between Vera Cruz and Morelos Railroad, State of Mexico. | .....do..... | 26 | 12,880 | 336,000 |
| *Dec.* 15. From coal deposits on Yaqui river to Guaymas. | Standard. | 122 | No subsidy. | |
| *Dec.* 15. Merida and Valladolid Railroad, passing through Ixtakok, Motul, and Izamal, State of Yucatan. | Narrow.... | 106 | 9,660 | 1,023,960 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1881. | | | | |
| *Jan.* 10. Extension of San Andrćas Chalchicomula to Jalapa Railroad to port of Vera Cruz, States of Puebla and Vera Cruz. | Narrow.... | 144 | $12,880 | $2,854,720 |
| *Jan.* 19. Extension of line from El Salto to Maravatio, passing Tepeji and Jilotepec, States of Mexico and Michoacan. | Standard. | 146 | 200,000 per annum. | |
| *Feb.* 2. Capital San Luis Potosi to most convenient point on Mexican Central Railroad, near city of Aguascalientes, States of San Luis Potosi and Aguascalientes. | .....do..... | 100 | 14,295 | 1,429,500 |
| *Feb.* 3. Compañia Station, on the Morelos Railroad, to town of Tlalmanalco. | Narrow.... | 7 | 9,660 | 86,940 |
| *Feb.* 23. City of Campeche to town of Calkini, and extension to Lerma, State of Campeche. | .....do..... | 47 | 9,660 | 447,020 |
| *Apr.* 26. Tehuantepec Ship-railroad. Charter granted to Captain J. B. Eads. | Optional. | 166 | No subsidy. | |
| *May* 26. Mexican Southern Railroad Company. From Mexico City to frontier of Guatemala, passing through city of Puebla, touching at city of Oaxaca and at ports of Vera Cruz and Anton Lizardo, on Gulf of Mexico, and at those of the States of Chiapas and Oaxaca, on the Pacific, with various branches southward and westward. Afterwards charter extends this line to the northern frontier. | Standard. | 1,920 | No subsidy. | |
| *June* 7. International Railway Improvement Company, from a point on the Rio Grande between Laredo and Reynosa southward, passing | .....do..... | 1,542 | 12,880 | 19,860,960 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1881. through San Fernando, Santander, Jimenez, &c., to City of Mexico, with branches to Pacific and to Vera Cruz, as also other Gulf ports. | | | | |
| *June* 7. International Construction Company. From a point on the Rio Grande twenty-five leagues above or below Piedras Negras to City of Mexico, and from some convenient point on the main line to a point on the Gulf of Mexico between the ports of Matamoras and Vera Cruz, and a line to the Pacific at most convenient point between Mazatlan and Zihuatanejo. | Standard. | 1,500 | No subsidy. | |
| *June* 13. Texas, Topolobampo, and Pacific Railroad. From Topolobampo to Piedras Negras, States of Sonora and Coahuila. Lines from most convenient points on the above to Alamos, State of Sonora, to Mazatlan, State of Sinaloa, and to Presidio del Norte, State of Chihuahua. | .....do..... | 1,517 | $8,050, except on Presidio del Norte branch. | $9,660,000 |
| *June* 22. Mexican Pacific Railroad, along the Mexican Pacific coast, from a point on the boundary line opposite Fort Yuma southward, to connect with International Improvement and Southern Railroad Company's lines and Mexican ports on the Pacific. | .....do..... | 1,500 | No subsidy. | |
| *June* 25. Nautla and San Marcos Railroad, from bar of Nautla, on the Gulf coast, between Vera Cruz and Tuxpam, to San Marcos Station, on Mexican Railroad, States of Vera Cruz and Puebla. | .... do..... | 111 | 9,660 | 1,072,260 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1881. | | | | |
| *June* 27. San Andréas Chalchicomula and Vera Cruz Railroad extension, from Perote or San Andréas to point on Morelos Railroad, and branch from Perote to Teziutlan. | Narrow.... | 165 | $9,660 | $1,593,900 |
| *July* 6. Mexican Central Railroad extension, line from Tantoynquita to port of Tampico, States of San Luis Potosi, to Tamaulipas. | Standard. | 75 | 15,295 | 1,147,125 |
| *July* 12. The Sierra Madre and Tierra Caliente Interoceanic Railroad, from point between Nautla and Tampico, on Gulf coast, passing through City of Mexico, to the Pacific, between Chacahua and Maruata, with branches to Cuernavaca. | .....do..... | 496 | No subsidy. | |
| *July* 20. Alamos to Yavaros, Sonora Railroad, from city of Alamos to port of Yavaros, or some other port selected by Federal Executive. | .....do..... | 56 | 9,660 | 540,960 |
| *July* 21. Sinaloa and Durango Railroad, from port of Mazatlan, on the Pacific, to city of Durango, and may be extended to Villa de Lerdo and Saltillo. | .....do..... | 445 | 11,270 | 5,015,150 |
| *Aug.* 3. Puebla and Tlaxiaco Railroad, from Puebla to Tlaxiaco, passing through coal regions, and touching at towns of Amatlan and Acatlan, and connect with Morelos Railroad. | Narrow.... | 149 | 9,660 | 1,439,340 |
| *Aug.* 8. Tabasco Railroad Company, from San Juan Bautista to Minatitlan or Coatzacoalcos, with branches to Teapa and Pichucalco, and to connect in State of Chiapas with Mexican Southern Railroad. | Standard. | 180 | 8,050 on main line, 9,660 on branch. | 1,497,300 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1881. | | | | |
| *Aug.* 26. Huasteca Railroad Company, from City of Mexico, passing between Pachuca and Tulancingo, through Carpinteros, Otlamacatlan, and Huejutla, to reach junction of rivers at Tantojon; branch from Huejutla to Tuxpam and Zacualtipam. | Standard. | 501 | No subsidy. | |
| *Sept.* 17. Pichucalco and Cosahuyapa Railroad, from town of Pichucalco to Cosahuyapa Pass, State of Chiapas. | Narrow.... | 136 | $8,855 | $1,204,280 |
| *Sept.* 20. San Andréas Chalchicomula Railroad, from Station of Dolores, on Mexican Railroad, to city of above name, State of Puebla. | .....do..... | 3 | 5,635 | 16,905 |
| *Dec.* 12. Lower California and Sonora Railroad, from Tijuana, on the frontier of the United States, passing through Punta Isabel, to connect with Sonora Railroad; branches to connect towns of Altar and Magdalena, State of Sonora. | Standard. | 246 | No subsidy. | |
| *Dec.* 23. Peralvillo and Reyes Railroad, from City Gate of Peralvillo, in the Capital, to Penon Baths, and connect at Los Reyes with Irolo Railroad. | Narrow.... | 13 | 9,660 | 125,580 |
| *Dec.* 26. Puebla and San Marcos Railroad, from Puebla to San Marcos, through San Juan de los Llanos; branch to Teapa, State of Puebla. | ....do..... | 52 | 5,635 | 293,020 |
| 1882. | | | | |
| *Jan.* 7. International Tamaulipas Railroad, from San Fernando, Tamaulipas, southward to port of Tampico. | Standard. | 136 | 12,880 | 1,751,680 |

| Date, designation, termini, and route. | Gauge. | Approx. length, English miles. | Amount of subsidy. | |
|---|---|---|---|---|
| | | | Per English mile. | Totals. |
| 1882. | | | | |
| *Jan.* 21. Road from Irolo, passing through Puebla, Chietla, or Izucar Matamoras, to connect with Morelos Railroad. | Narrow.... | 151 | $9,660 | $1,458,660 |
| *June* 28. Central Plateau Mexican Railroad, from City of Mexico, passing through Cuernavaca, Puente de Txtla, &c., to Zihuatanejo, on the Pacific, with branches to Ixtapa del Oro and chief towns of Michoacan to Morelia. | Standard. | 559 | No subsidy. | |
| *Sept.* 30. Huatusco and Camaron Railroad Company, from Camaron Station, on Vera Cruz Railroad, to city of Huatusco. | .....do..... | 19 | 8,855 | 168,245 |
| Grand totals..... | ..... | 17,194 | ..... | $126,131,005 |

There were during the year 1883 some slight changes in a few of the above concessions, some consolidations and some new grants, but the principal lines remain substantially the same as on January 1, 1883.

## Description of Principal Lines.

By reference to the map preceding this chapter it will be observed that there are seven transcontinental railway lines either projected or under construction across Mexico from the Gulf to the Pacific, as follows:

The American and Mexican Pacific, from Galveston, Texas, to Topolobampo Harbor on the Gulf of California.

The transcontinental division of the Mexican Central, extending from Tampico on the Gulf to San Blas on the Pacific.

The Mexican Railway, from Vera Cruz on the Gulf to the City of Mexico; and the Pacific division of the Mexican National, from the City of Mexico to Manzanillo on the Pacific.

The Acapulco, Morelos, Mexico, Irolo, and Vera Cruz Interoceanic line, from the Gulf to the Pacific.

The transcontinental division of the Mexican Southern, extending from Anton Lizardo on the Gulf near Vera Cruz to the Pacific side of the Isthmus of Tehuantepec.

The Tehuantepec Inter-Ocean road, from the mouth of the Coatzacoalcos river on the Gulf across the Isthmus to the Pacific.

The Tehuantepec Ship-Railway, from the Uspanapa river across the Isthmus to the upper lagoon on the Pacific.

There are five international trunk lines projected or under construction from the southern border of the United States to the City of Mexico, as follows:

The Mexican Central, from El Paso along the highlands of the interior to the City of Mexico.

The Mexican International, from Eagle Pass by way of the Lake district to the City of Mexico.

The Mexican National, from Laredo by way of Monterey and San Luis Potosi to the City of Mexico.

The Mexican Southern, (Northern Division,) from Laredo by way of Victoria to the City of Mexico.

The Tamaulipas International, from Matamoras along the Gulf coast to Tampico and Tuxpan, connecting there with another line to the City of Mexico.

Four of the transcontinental and four of the international roads are now under construction.

This is indeed internal improvement on a grand and comprehensive scale. The lines are, as will be observed, distributed over all parts of the Republic, the chief centre being the capital of the Republic, which, unlike that of the United States, is its commercial metropolis.

## Will they Pay?

In expressing an opinion about the probable financial success of the various railway enterprises in Mexico, it may be well to correct a few popular errors and restate from previous pages some general facts.

It is urged that too many roads are under construction in that country —that the business is being overdone. In reply we invite attention to the fact that the total mileage of concessions in force the first of January, 1883, was but 17,194, or less than half the mileage now required from the stand-point of area and natural resources, and 10,000 less than

the mileage now required from the stand-point of population to place Mexico on a level with the United States.

Again, the opinion is too often entertained that the precious metals constitute the chief part of Mexico's resources. In reply we refer to the facts and figures upon previous pages on the subject of its varied and abundant agricultural and forest wealth. We also invite attention to the fact that railways in mining countries are considered very profitable. In the opinion of competent judges—persons who have had occasion, in a business way, to observe the amount of transportation accruing to railways which intersect mining regions—one good developed silver or gold mine furnishes more patronage than a city of ten thousand inhabitants. This is considered a moderate estimate of the value of a mine to a railway. The vast amount of transportation required by mining regions is owing to the fact that heavy machinery, timbers for the mines, supplies, and provisions have to be brought from other points.

If it is urged that through or international business must be the chief support of the railways extending from the United States to the City of Mexico, we invite attention to the fact that there are already many large cities and towns along the line of these roads, and that many others will soon spring into existence, as they did along the Union, Central, and other Pacific roads of the United States.

The railways from the interior of Mexico to the seaboard on either side connect the three classes of elevations with dissimilar climates, resources, products, and wants, and therefore must form a connecting-link between supply and demand. Travel for pleasure will also constitute a large item in the patronage of these roads, for the reasons which we will state in a subsequent chapter. The through business between the two Republics will doubtless be far greater than generally supposed, for the reason above stated, that the two countries are the reverse and complement of each other in general characteristics, such as climate, products, supply, and demand.

It may be urged that the products of Mexico are small and therefore will supply but little patronage. The premise is true for the reason that Mexico in the past has had but little incentive to extensive production, but the conclusion is erroneous, for when adequate transportation facilities are supplied the agricultural, mining, and forest industries will develop in a manner wholly unprecedented in that country, and beyond the expectation of those who have never witnessed the magic effect of new railways through the trans-Mississippi regions of the United States.

Doubts have also been entertained about the success of railway enterprises in Spanish-American countries. On this point we will quote from a recent and elaborate letter to the London *Economist* by Mr. Nevin, Secretary of the Mexican National Railway. After enumerating 35 South American railways and stating their capital stock, par value and market quotations, he closes as follows:

"As a class, the securities of these roads stand high. Twenty-five sell at par or over. Of the ten below par, six are paying dividends, and the shares range respectively from 67 to 98. When it is noted, further, that one of these ten is yet under construction, and that seven of them are in Peru or Chili, at this moment prostrated by an unusually severe, long, and destructive war, the standing of the Spanish-American lines, as a whole, is exceptionally good. Thirty-one of the thirty-five are now yielding and dividing returns."

In this letter he expresses the opinion that Mexico is "probably the richest of all the Spanish-American States," and that "Mexico is the most favored commercially, in being contiguous to an active, trading, friendly people, 50,000,000 strong."[1]

There is another point of difference between railways in Mexico and the nations of South America. Great navigable rivers like the Amazon and its tributaries, the Orinoco, La Plata, and Paraguay, transport a large portion of the freights of those countries, whereas in Mexico railways will substantially have a monopoly of the transportation business.

Costly construction and mismanagement can of course prevent the financial success of railway enterprises in Mexico or any other country, but for legitimate enterprises judiciously managed Mexico undoubtedly offers to the railway capitalist as open and promising a field as can be found upon the face of the earth.

[1] Letter to the London *Economist*, reproduced in the Denver *Republican* of May 3, 1883.

## IX.

# "THE BRIDGE OF THE COMMERCE OF THE WORLD."

### The Tehuantepec Inter-Ocean Route.

THE Isthmus of Tehuantepec, in the southern part of Mexico, is a natural and well-located bridge for the transportation of commerce between the two great oceans of the world. It will be seen, by reference to the map on the opposite page, that vessels can go from this Isthmus in a direct course to almost every important port of the world.

In this respect it is far superior to the Isthmus of Suez.

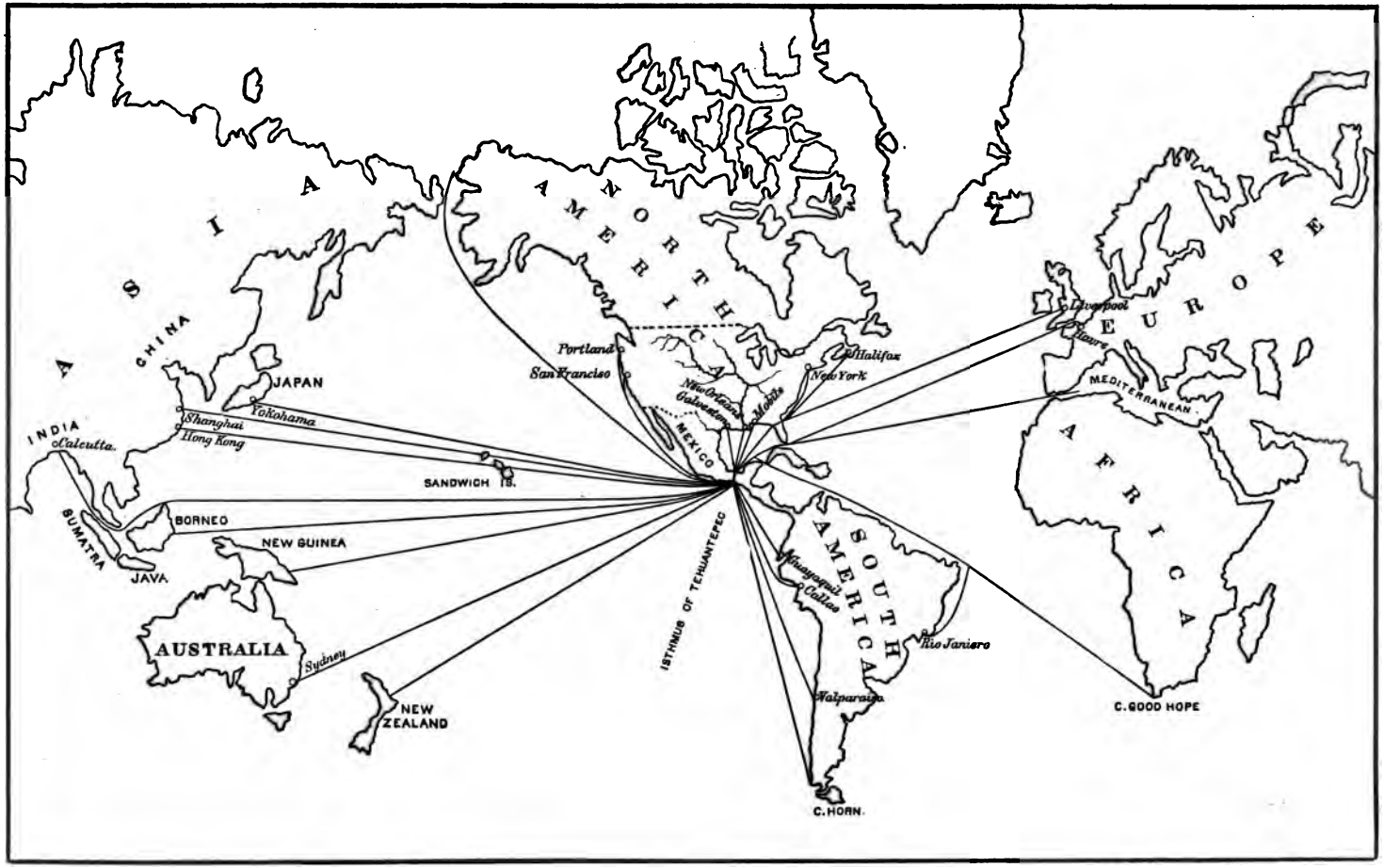
The contrast between the American Isthmus, considered as a whole, and that of Egypt was clearly expressed in the recent official report on Interoceanic Communication, by Lieutenant Sullivan, of the United States navy, who said: "It is to be noted that the Isthmus of Suez is but the centre of the old continent; the American Isthmus is the centre of the oceans."[1]

The contrast also between the Mexican and Panama divisions of the American Isthmus is equally favorable to Tehuantepec, for vessels coming from the Pacific can go from that isthmus in a direct line to the mouth of the Mississippi, Galveston, Mobile, and other Gulf ports, while those crossing Panama have to take a round about course to reach the same destinations.

By reference to the map of Mexican highlands, preceding chapter I, it will be seen that there is a natural break at Tehuantepec in the table-lands and mountains extending from the United States through the whole extent of Mexico to Central America. The passage here between oceans may be made at an elevation not to exceed at the highest point 684 feet.

After Cortez had completed the conquest of Mexico his chief ambition seems to have been the discovery of a water-way between the two oceans, for, in his fourth letter to Charles V, dated October 15, 1524, he says: "Being well aware of the great desire of your majesty to know concerning the supposed strait, and of the great advantage the crown would derive from its discovery, I have laid aside all other schemes, more obvi-

[1] House Ex. Doc. 107, 47th Congress, 2d sess, p. 32.




"THE BRIDGE OF THE COMMERCE OF THE WORLD."

ously tending to promote my interests, in order to pursue this object alone."[1]

He did not succeed in finding a water-way, nor is one practicable at Tehuantepec; but he found a natural "bridge," which modern science and invention will soon impress into the service of the world's commerce by the construction over it of a ship-railway. In other words, the genius of Eads is supplementing the work of Cortez in this respect by the projection across the Isthmus of a highway for the transportation of commerce between the two seas and their surrounding nations. The Republic of Mexico has already granted a most liberal concession in support of this enterprise, and the preliminary surveys of the route were recently completed.

*Its Importance to Mexico.*—Mexico above the Isthmus is wedge-shaped, the apex being at Tehuantepec, across which there is yet no passage for ships. To cross from the Gulf to the Pacific they must go around distant Cape Horn at the southern extremity of South America. The opening of the route both for commercial and military purposes is then a matter of transcendent importance to Mexico. Daniel Webster said of it in an official letter while Secretary of State in 1851:[2]

"No one can fail to see how exceedingly important this communication would be to the Government of Mexico. It proposes to give her a practical highway from sea to sea. It opens to her a communication on the one side and the other with the Eastern and the Western World. It gives her access to the markets of all nations, and makes her, in short, a central point of the commerce of modern times."

Now that Mexico has just placed upon the seas a new merchant marine, this great work assumes additional importance, and should be prosecuted with the utmost vigor.

*Its Importance to the United States.*—The importance of this Isthmus to the United States is very forcibly stated by Commodore Shufeldt, of the United States navy, in his official report of the survey made in 1871. He says:

"Each Isthmus rises into importance as it lies nearer to the centre of American political and commercial influence, and the intrinsic value of this eminently national work ought to be based upon the inverse ratio of the distance from that centre." * * * "A canal at this point becomes a part of our own internal water communication as well as affording a channel for the external commerce of ourselves and of the world."

[1] Cortez's Dispatches, p. 419. [2] Sen. Ex. Doc. No. 97, 32d Congress, 1st sess.

* * * "A canal through the Isthmus of Tehuantepec is an extension of the Mississippi river to the Pacific Ocean. It converts the Gulf of Mexico into an American lake." * * * "So to speak, it renders our own territory circumnavigable." * * * "Such is the character of the intervening waters that it permits a canal boat to load at St. Louis and discharge her freight in California with but little more than the risk of inland navigation. As a matter of political economy, as well as of commercial necessity, a canal here assumes the gravest proportions."[1]

Direct water intercommunication between the two coasts of the United as well as Mexico is barred by the Isthmus, and vessels between New York and San Francisco, and the mouth of the Mississippi and San Francisco, must now go around Cape Horn. True, the barrier is being pierced at Panama, but that route is also too distant for the coastwise and interocean trade of the United States.

The comparative distances in statute miles along the shortest steamship routes are as follows:[2]

| | *Statute Miles.* |
|---|---|
| New York to San Francisco via Isthmus of Tehuantepec | 4,905 |
| " " " Panama | 6,057 |
| Saving via Tehuantepec (one way) | 1,152 |
| " " (round trip) | 2,304 |
| New Orleans to San Francisco via Isthmus of Tehuantepec | 3,576 |
| " " " Panama | 5,412 |
| Saving via Tehuantepec (one way) | 1,836 |
| " " (round trip) | 3,672 |

Viewed from still another stand-point, the advantages of the Tehuantepec route are equally striking. Suppose, for instance, the projected Florida Ship Canal was complete and the Tehuantepec Ship-Railway (which for all practical purposes is a water line) was now in operation, the two would form almost an air line from New York to the Pacific. This water route contrasted with the existing transcontinental railways from New York to the Pacific is more than a thousand miles shorter.

The respective distances in statute miles are as follows:

| | |
|---|---|
| New York to the Pacific at San Francisco via Union and Central Pacific Railways | 3,340 |
| New York to the Pacific at Portland via Northern Pacific Railway | 3,237 |
| New York to the Pacific at Tehuantepec via the Florida—Tehuantepec route | 2,232 |

[1] Sen. Exec. Doc. No. 6, Forty-second Congress, 2d session.

[2] Measured by U. S. Coast Survey.

In other words, the water route via Tehuantepec is 1,005 miles shorter than that via the Northern Pacific Railway and 1,108 shorter than that via the Union and Central Pacific Railways.

But it may be urged that Tehuantepec is too far south to strike the Pacific for purposes of foreign commerce with the nations and islands surrounding that ocean.

On the contrary, vessels from the United States to the Pacific countries, which rank highest in value of annual trade with the outside world, such as Australasia and India, have to go south of the latitude of Tehuantepec.

During the last attainable year the total foreign commerce of China and Japan north and Australasia south of this isthmus was as follows:

| | |
|---|---|
| Japan | $56,916,000 |
| China | 223,349,000 |
| Australasia | 253,600,000 |

Making a general contrast of the various routes by land and sea from New York to the Pacific at different points, such as the terminus of the Canadian Pacific road, San Francisco, San Diego, Tehuantepec, Nicaragua, Panama, and Cape Horn, we find that the short, direct, and central course is via the Florida-Tehuantepec all-water route.

With these facts in mind we can readily understand why several administrations of the United States have taken such a deep and active interest in the transit line across Southern Mexico.

In 1847, during the negotiations between the two Republics which finally resulted in the treaty of Guadalupe Hidalgo of 1848, James Buchanan, then Secretary of State, sent the following instructions to Nicholas P. Trist, the commissioner of the United States at the City of Mexico: "Instead of fifteen millions of dollars stipulated to be paid by the fifth article for the extension of our boundary over New Mexico and Upper and Lower California, you may increase the amount to any sum not exceeding thirty millions of dollars, payable by instalments of three millions per annum, provided the right of passage and transit across the Isthmus of Tehuantepec, secured to the United States by the eighth article of the projet, shall form a part of the treaty."[1]

In 1850, Daniel Webster, while Secretary of State, said in a letter to the United States minister at Mexico: "The American public at large has a great and obvious interest in the Tehuantepec passage."[2]

[1] Sen. Exec. Doc. 60, Thirtieth Congress, 1st session, p. 44.

[2] Sen. Exec. Doc. 97, Thirty-second Congress, 1st session.

In 1851, President Fillmore said in his message to Congress:

"In negotiating upon this important subject this Government has had in view one and only one object. That object has been and is the construction or attainment of a passage from ocean to ocean, the shortest and the best for travellers and merchandise, and equally open to all the world. It has sought to obtain no territorial acquisition nor any advantages peculiar to itself, and it would see with the greatest regret that Mexico should oppose any obstacle to the accomplishment of an enterprise which promises so much convenience to the whole commercial world and such eminent advantages to Mexico herself. Impressed with these sentiments and these convictions, the Government will continue to exert all proper efforts to bring about the necessary arrangement with the Republic of Mexico for the speedy completion of the work."

In 1857, Lewis Cass, while Secretary of State, said in an official letter:

"The proximity of the Isthmus to our shores, the salubrity of the climate, the adaptness of the ground for the construction of a railroad, and the great diminution of distance in comparison with more southern routes between our Atlantic and Pacific possessions, all conspire to point it out as far preferable to any other route outside of our own territory."[1]

In 1859, during the administration of President Buchanan, while a treaty of transits and commerce was under negotiation between the two Republics the United States minister at Mexico, in one of his dispatches to the State Department, said of the proposed lines—one across northern Mexico and the other across the Isthmus of Tehuantepec—"Exercising my own discretion and judgment, I would appropriate five million dollars to the transits."

Thus it appears that this interocean route was for years the favorite one of American statesmen. It is to-day as much more important than when these various negotiations were pending as is a ship-railway superior to an ordinary railway. But now that Mexico has granted a most liberal concession to an American citizen for the transit of ships across it, the United States is apparently indifferent to the subject.

It cannot afford to be so, and thereby allow England to come inside the Gulf of Mexico and establish a toll-gate at the Isthmus, which, as we have shown, is practically a supplement of the Mississippi river and connects it with the Pacific Ocean. The Monroe doctrine cannot be urged against England securing this commercial foothold, for it is a business matter and not the importation to an American country of a European

[1] Sen. Exec. Doc. No. 72, Thirty-fifth Congress, first session, pp. 39–40.

form of government, like the Maximilian movement in Mexico. But in a business way the United States should use every possible exertion to prevent its great commercial rival from practically acquiring this key to the Gulf.

In 1803, when Napoleon I could not hold Louisiana Territory against the power of England, he concluded to sell it to the United States. During the negotiations on this subject he foreshadowed his action by the following remark to one of his counsellors: "To emancipate nations from the commercial tyranny of England it is necessary to balance her influence by a maritime power that may one day become her rival; that power is the United States. The English aspire to dispose of all the riches of the world. I shall be useful to the whole universe if I can prevent their ruling America as they rule Asia."[1]

In a subsequent conversation with two of his ministers, on the 10th of April, 1803, on the subject of the proposed cession, he said in speaking of England: "They shall not have the Mississippi which they covet."[2]

In accordance with this conclusion, on the 30th day of the same month, the sale was made to the United States. When informed that his instructions had been carried out and the treaty consummated, he remarked: "This accession of territory strengthens forever the power of the United States, and I have just given to England a maritime rival that will sooner or later humble her pride."[3]

A similar principle is involved in the control of the concession for the transportation of ships across the Isthmus of Tehuantepec, which, as we have shown, is a supplement of the Mississippi, and connects it with the Pacific Ocean.

True, the concession itself cannot be transferred to any foreign government, but its earnings may; and in this indirect way France, England, or other European powers may secure a commercial foothold inside the Gulf. Article 27 of the concession reads as follows:

"If, by reason of the magnitude of the work to which this contract refers, the company should receive aid in money or in guarantees from some foreign government, the company may give to that government all the security of assignment and intervention in the earnings of the road which it may agree to do with that government; provided this be done without attacking the clauses of this contract."

[1] Marbois' History of Louisiana, p. 260.
[2] Gayarre's History of Louisiana, p. 473.
[3] Marbois' History of Louisiana, p. 260.

The United States cannot afford by inaction to let a European rival secure such a commercial advantage.

This concession and at least six previous ones relating to the Tehuantepec route were given to citizens of the United States. None were ever given to citizens of Great Britain, and only by transfer in two instances did citizens of that country obtain concessions, both of which afterwards became null and void.

Sound public policy requires that the two great Republics should continue to co-operate, as they have in the past, in the control of this most important gateway between the two oceans and the two American coasts.

It is sufficiently unfortunate that all but one of the forty principal West India islands are controlled by foreign powers, chiefly European, and not even that one, which is an independent republic, owned by the United States. But it would be humiliating to see England come inside the Gulf, which is nearly surrounded by the two sister Republics, and secure commercial advantages which naturally belong to America.

In an elaborate article on America in the North American Review in 1878, Gladstone, in contrasting the commercial future of England and the United States, said:

"It is she alone who at a coming time can and probably will wrest from us that commercial primacy. We have no title—I have no inclination to murmur at the prospect. If she acquires it she will make the acquisition by the right of the strongest; but in this instance the strongest means the best. She will probably become what we are now, the head servant in the great household of the world, the employer of all employed, because her service will be the most and the ablest. We have no more title against her than Venice or Genoa or Holland has had against us."

There is no better way to facilitate the attainment of the "commercial primacy" here prophesied than by keeping under American control this important key to the gulf, which is a connecting link between the two coasts of each Republic.

## The Inter-Republic Route.

The Isthmus of Tehuantepec is not only a bridge between oceans, the East and the West, but also between Republics, connecting, as it does, North with Central and South America. The first century of the United States was mainly devoted to formulating and perfecting a theory of government and the extension of commercial relations with the nations of Europe, but as the Secretary of State said in 1877, in a circular

letter to the official representatives of the United States in the Spanish-American countries, "it is believed that the period has now arrived when it would be wise for all the nations of this continent to consider more carefully how they may best enlarge their trade with each other." This idea has for several years past been earnestly advocated by Hinton R. Helper, who has devoted much time and money to the work. During the present session of Congress a bill has been introduced in the Senate "to authorize the appointment of a special commissioner to visit the principal countries of Central and South America for the purpose of collecting information looking to the extension of American trade and commerce, and the strengthening of friendly and mutually advantageous relations between the United States and other American nationalities."

To reach these various countries by land there is but one route, and that through the Isthmus of Tehuantepec.

South of this isthmian bridge, in the states of Central and South America, is a present annual commerce with all nations (exports and imports of merchandise combined) of $618,185,000 in value.[1]

North of it, in Mexico and the United States, is a present annual commerce with all nations (exports and imports of merchandise combined) of $1,600,042,000 in value.[2]

The interchange, however, of commerce between these nations north and south of the Isthmus is at present very small. A railway is needed to bind them together in closer commercial and more intimate social and political ties.

By reference to the map of Mexican railways preceding chapter VIII it will be seen that there are already five international lines either projected or under construction from the United States to the City of Mexico. Also that these roads are supplemented and prolonged to the borders of Central America by the southern division of the Mexican Southern Railway, of which General Grant is president. Here, then, is a tangible step toward carrying out the idea of closer trade relations with the nations of Spanish America.

The tidal wave of material development which is sweeping over Mexico will never cease its flow until it has crossed Tehuantepec and spread its progressive influences over the nations of Central and South America.

Mexico is indeed fortunate in possessing the isthmian bridge between Oceans and Republics, over which the nations of the world must interchange their products, manufactures, and friendly greetings.

[1] Compiled from U. S. Commercial Relations for 1881 and 1882. [2] Ditto.

X.

# NATIONAL FINANCES.

## The Old Debt.

THIS is for various reasons a complicated subject into the consideration of which we will not attempt to enter, except far enough to reach some general admitted facts as a basis for certain contrasts and conclusions.

In 1879 the Secretary of Finance of Mexico, in an elaborate official report on the actual condition of that country, said of the public debt: "It appears from the liquidation that has now been completed with all the different classes of titles that form the Mexican debt and which is more exact than any former information, that the total is $117,193,727."

The present admitted debt of Mexico is in round numbers about as follows:

| | |
|---|---|
| Home debt | $25,000,000 |
| Foreign debt | 100,000,000 |
| Total | $125,000,000 |

## Contrast with Debts of other Nations.

The total public debt of Mexico contrasted with that of other nations for the last attainable year is as follows:[1]

| | | | |
|---|---|---|---|
| 1. France | $4,683,840,000 | 12. Australasia | $449,551,245 |
| 2. Russia | 4,314,607,599 | 13. Portugal | 430,879,399 |
| 3. Great Britain | 3,814,500,000 | 14. Brazil | 409,866,550 |
| 4. Italy | 2,042,000,000 | 15. Netherlands | 376,523,380 |
| 5. United States | 1,918,312,994 | 16. Belgium | 341,917,662 |
| 6. Spain | 1,826,613,093 | 17. Japan | 311,294,347 |
| 7. Austria-Hungary[2] | 1,685,424,276 | 18. Paraguay | 251,000,000 |
| 8. Germany[2] | 1,349,728,232 | 19. Peru | 241,650,000 |
| 9. British India | 765,673,425 | 20. Canada | 199,861,537 |
| 10. Turkey | 532,186,170 | 21. Roumania | 125,727,822 |
| 11. Egypt | 529,383,150 | 22. Mexico | 125,000,000 |

[1] All except debt of Mexico compiled from American Almanac for 1883, by Ainsworth R. Spofford, Librarian of Congress.

[2] Including separate States. [3] Ditto.

In view of Mexico's wonderful natural wealth, which is now for the first time to be adequately developed, its public debt is truly insignificant in amount.

Contrasted with other nations Mexico is, then, comparatively free of debt, and enters the race for commercial supremacy under most favorable circumstances.

## New Obligations.

The total subsidies promised to the various railway companies to January 1, 1883, was $126,131,005, which amount has been somewhat increased during the past year. Other business enterprises have also been subsidized, the total amount of which is not at present accessible, but probably to no great extent.

These subsidies, however, do not represent an existing debt, for they are to be paid on certain conditions, such as the completion of so many miles of road, etc. Nor are they all to be paid in cash, but partly in custom-house orders on revenues to be collected thereafter.

This hypothecation of revenue, it should be remembered, is to the very agencies which are stimulating a new and comprehensive material development, and therefore creating national wealth.

## Revenues.

The history of the past furnishes no safe guide for estimating the future revenues of Mexico for the reason that industries and commerce have been paralyzed for want of transportation facilities. The record of the past year, however, gives some indication of what results may be expected to flow from the new development of that country.

President Gonzalez, in his message to Congress in the fall of 1883, says:[1]

"I feel great satisfaction in being able to inform Congress that the new system of public accounts works well and affords the Executive an exact statement of the condition of the national finances.

"According to these data, furnished by the account of the last fiscal year, the revision of which is nearly completed, the revenue amounted to $33,500,000, there being an increase of over $3,000,000 on the receipts of the previous year. The revenue includes $18,000,000 from duties on imports, and, although these receipts are swelled by exceptional causes, the amount from import duties in the year 1882–'83 shows an increase

[1] From *Times-Democrat* of New Orleans, Dec. 7, 1883.

of $2,000,000 over that in 1881–'82, taking into consideration only the regular importations."

What effect the pending commercial treaty with the United States (in event of its ratification) will have upon the sum total of duties from imports is of course but a matter of conjecture. There will be a decrease of revenues from the importation of certain articles, but this decrease will probably be more than counterbalanced by the general increase of dutiable importations.

Suppose, however, the sum total of customs revenues should be insufficient to meet the obligations of the Government, the deficiency can be provided for by an internal revenue tax similar to that of the United States, or in other ways.

In view of the fact that Mexico is endowed with natural wealth in the greatest profusion, and the certainty that its industries and commerce are now to be developed on a grand scale, the question of revenue becomes simply one of legislation. Mexico's ability in this respect will soon be practically unlimited. All that is wanted is that ways and means be provided to meet its various obligations, which, as we have above shown, are truly insignificant in amount when contrasted with the public debts of other and less favored nations.

XI.

## ATTRACTIONS.

A DESCRIPTION of the antiquities, scenery, climate, and various other attractions of Mexico as a place of residence and a resort for the student and tourist do not properly belong to the pages of a commercial brief. But there are certain features of these attractions which have a bearing upon the development of material interests, and will add greatly to the nation's wealth. It is to these features that we invite for a moment the attention of the reader.

### Highland Homes.

Doubtless one of the chief attractions of Mexico is its highland formation and salubrious and equable climate, where one may escape from the fogs, malarias, and depressing influences of the swampy and alluvial regions of river valleys and the seaboard, and find a home beneath clear, healthful, and Italian-like skies.

A good climate is not only one of the greatest of luxuries, but is an absolute necessity for thousands of suffering humanity. It is a luxury which, in itself, costs no money, but immense sums are spent every year in the pilgrimage to find it. Business is neglected, and expense disregarded by those whose lives depend upon the pure, dry, and exhilarating air of high elevations, and an escape from the severity of northern winters. All of these good qualities may be found in the climate of Mexico to a degree unsurpassed by any other part of the world.

The effect of this rare atmosphere upon the scenery of the highlands is prettily described in the following extract from a letter to the *Boston Herald* by its Mexican correspondent:[1]

"The difference in tone in the landscapes at the various altitudes in Mexico is marked, and it reminds me of the different keys in which painters pitch their pictures. Toluca, for instance, over 1,000 feet higher than Mexico, has thin, clear air, a transparent brightness of color, and its cool shadows are not deep; in the valley of Mexico, about the capital, it seems perpetually May-like, fresh, and vigorous; at Queretaro, over 1,000 feet lower, it is full and luxuriant, with vegetation rich and juicy in its prosperous abundance. The ripe, joyous aspect, the friendly

[1] *Boston Herald*, Sept. 9, 1883.

sunshine and deep, grateful shade, everything infused with mellow color, reminding one of Mark Waterman's pictures."

But we have already described the highlands of Mexico in chapter I and its accompanying map, and will not, therefore, treat of it further in this connection.

## Antiquities.

To the student there is no greater pleasure than a visit to the ancient ruins of the classic nations. In his college course the study of ancient America has been sacrified for the study of ancient Greece and Rome. It is not unreasonable that the study of the antiquities of foreign civilized nations should be more attractive and instructive than the antiquities of wild Indian tribes at home. But there is one portion of North America which abounds in antiquities of a very brilliant civilization. We refer to the ruins of the Aztecs, Toltecs, and still earlier nations of Mexico. To describe these ruins would require at least a dozen volumes, and to illustrate them would require a fortune of large dimensions, for Lord Kingsborough's illustrated work on Mexican Antiquities cost over one hundred and sixty thousand dollars. We can only mention a few significant facts and figures, and call the attention of the reader to the authorities on this subject, to show that they are among the great attractions of that country. They are attractions which will be appreciated when railway facilities will enable the student and tourist to conveniently visit that part of classic America.

Of Yucatan, the southern State of Mexico, Bancroft states it "presents a rich field for antiquarian exploration, furnishing, perhaps, finer and certainly more numerous specimens of ancient aboriginal architecture, sculpture, and painting than have been discovered in any other section of America. The State is literally dotted, at least in the northern, central, or best known portions, with ruined edifices and cities."[1] Stephens, who was the first one to make an extensive exploration of Yucatan, and whose two interesting volumes that record his discoveries contain one hundred and twenty engravings illustrating the ruins, says: "In our long, irregular, and devious route we have discovered the crumbling remains of forty-four ancient cities, most of them but a short distance apart."[2] Many of these ruins will compare favorably with the ruins of the European classic nations, as a reference to illustrations contained in Stephens', Lord Kingsborough's, Catherwood's, and other works will prove.

[1] Bancroft's "Native Races," IV, 143. [2] Stephens on Yucatan, II, 444.

In the State of Chiapas are the massive ruins of the ancient city of Palenque, which Stephens, the explorer, says "are the first which awakened attention to the existence of ancient and unknown cities in America."[1] The principal building, called the Palace, is thus described by Baldwin: "It stands near the river, on a terraced pyramidal foundation forty feet high, and three hundred and ten feet long, by two hundred and sixty broad at the base. The edifice itself is two hundred and twenty-eight feet long, one hundred and eighty wide, and twenty-five feet high. It faces the east, and has fourteen doorways on each side, with eleven at the ends.

"It was built entirely of hewn stone, laid with admirable precision in mortar, which seems to have been of the best quality. A corridor nine feet wide, and roofed by a pointed arch, went round the building on the outside, and this was separated from another within, of equal width. The 'Palace' has four interior courts, the largest being seventy by eighty feet in extent. These are surrounded by corridors, and the architectural work facing them is richly decorated."[2]

A clearer idea of the grandeur of this palace and of other ruins of Palenque may be found in Lord Kingsborough's costly illustrations of the "Antiquities of Ancient Mexico," vol. IV, Plates 19 to 45, inclusive, of Part III; in Catherwood's "Views of Ancient Monuments," Plates 6 and 7; in Stephens' illustrated work on "Chiapas, Yucatan," etc., vol. II, pp. 284–358, and in Bancroft's "Native Races," vol. IV, p. 310, which contains a view of the palace restored.

Stephens' comment, after visiting these ruins, indicates the attractions they offer for the student of ancient America. He says: "In the romance of the world's history nothing ever impressed me more forcibly than the spectacle of this once great and lovely city overturned, desolate, and lost."[3]

In Oaxaca are the ruins of the ancient city of Mitla. They are even more magnificent than those at Palenque. According to Baldwin, the ruins of six edifices and three pyramids are all that now remain.[4] He gives a translation of Dupaix's description of four palaces, as follows: "They were erected with lavish munificence;" * * * "they combine the solidity of the works of Egypt with the elegance of those of

[1] Incidents of Travel in Central America, Chiapas, and Yucatan, by J. L. Stephens, vol. II, p. 294.

[2] Ancient America, by J. D. Baldwin, p. 104.

[3] Vol. II of his "Incidents of Travel," p. 357.

[4] Ancient America, by J. D. Baldwin, p. 117.

Greece." * * * "But what is most remarkable, interesting, and striking in these monuments, and which alone would be sufficient to give them the first rank among all known orders of architecture, is the execution of their mosaic relievos, very different from plain mosaic, and consequently requiring more ingenious combination and greater art and labor. They are inlaid on the surface of the wall, and their duration is owing to the method of fixing the prepared stones into the stone surface which made their union with it perfect."[1]

The justice of this tribute will readily be admitted by the reader if he will visit the Congressional Library at Washington, the Astor Library in New York, or some other of the few public libraries which possess a copy of Lord Kingsborough's illustrated work, and examine Plate No. 82 of vol. IV, Part III, which represents the ruins of the "First Palace."

Other illustrations of the ruins of Mitla may be found in Bancroft's "Native Races," vol. IV, pp. 388–417, and in vol. IV, Part II, Plates 78–95, inclusive, of Lord Kingsborough's work.

## The Paris of America.

The City of Mexico has been called the "Paris of America," and the surrounding valley, which is set in a picturesque framework of mountains, the "Paradise of America,"

The city itself is elevated nearly 7,500 feet above the level of the sea. The valley or plain is in the form of an ellipse, about 45 miles long by 30 broad, and is "enclosed by irregular mountain ridges and volcanic peaks rising to a height of from 12,000 to 18,000 feet, the summits of two of which are covered with perpetual snow."[2]

Its appearance as first seen by the Spanish conquerors, when on their march to the Aztec capital they reached the summit of the surrounding mountains, is beautifully described in the following word-painting of Prescott: "Its picturesque assemblage of water, woodland, and cultivated plains, its shining cities and shadowy hills, was spread out like some gay and gorgeous panorama before them. In the highly rarefied atmosphere of these upper regions even remote objects have a brilliancy of coloring and a distinctness of outline which seem to annihilate distance. Stretching far away at their feet were seen noble forests of oak, sycamore, and cedar; and beyond, yellow fields of maize, and the towering maguey intermingled with orchards and blooming gardens; for

[1] Ancient America, by J. D. Baldwin, p. 117.

[2] See Report to State Department by U. S. Consul-General Strother of Nov. 15, 1880.

flowers, in such demand for their religious festivals, were even more abundant in this populous valley than in other parts of Anahuac. In the centre of the great basin were beheld the lakes, occupying then a much larger portion of its surface than at present; their borders thickly studded with towns and hamlets in the midst—like some Indian empress with her coronal of pearls,—the fair City of Mexico, with her white towers and pyramidal temples reposing as it were on the bosom of the waters, the far-famed 'Venice of the Aztecs.'"[1] The city and lakes have changed since the days of the conquest, but in other respects the magnificence of the combination of mountain and valley remains the same.

The modern City of Mexico was thus complimented by Baron Humboldt about the beginning of the present century: "Mexico is undoubtedly one of the finest cities ever built by Europeans in either hemisphere. With the exception of Petersburg, Berlin, Philadelphia, and some quarters of Westminster, there does not exist a city of the same extent which can be compared to the capital of New Spain, for the uniform level of the ground on which it stands, for the regularity and breadth of the streets, and the extent of the public places.[2]

The city has a present population of about 300,000, being about the size of St. Louis. It will also soon rival that city as a railway centre, as may be seen by reference to the map preceding chapter VIII. Being the capital of the Republic, it is the political centre. It is also the commercial metropolis, and the financial, educational, literary, and art centre. It is, in brief, a city with a great future. There is, however, one temporary defect of a serious nature. We refer to the lack of drainage and the consequent unhealthiness. The drainage of the city requires also the drainage of the neighboring lakes and surrounding valley, and this can only be done by piercing the mountain rim at a cost of several million dollars.

Several elaborate surveys for this purpose have already been made and the feasibility of the project favorably reported. The work will doubtless soon be undertaken and pushed to completion. When it is successfully accomplished and the health of the city thereby secured, Mexico will, indeed, become the Paris of America in fact as well as theory.

## A Favorite Resort.

In view of the various attractions above enumerated and many others which might be described did space permit, Mexico will on the comple-

[1] The Conquest of Mexico, by W. H. Prescott.

[2] Humboldt's New Spain, vol. II, p. 29.

tion of the several railways under construction between the two Republics undoubtedly become a favorite resort for residence, health, pleasure, and the study of classic America.

But what bearing has all this upon the material interests? We will briefly state by citing the experience of Americans in Europe.

*Money spent by Americans in Europe.*—United States Consul Potter, in a report to the State Department from Stuttgart, gives the following facts in regard to the number of passengers who were transported across the Atlantic during the year ending June 30, 1878, and the amount of money spent annually by Americans in Europe. The sum total it will be observed is more than *one hundred million dollars*. He says:

"It appears, therefore, that the total number of persons transported during the year by the steamship lines named, not including crews, was 86,889 to Europe and 108,334 to America, together making 195,223. The movement of this vast multitude across the Atlantic Ocean was effected without accident of any kind."

* * * * * * * *

"According to estimates furnished by some of the greater carrying lines, 80 per cent. of the cabin passengers travelling in both directions were Americans. If this estimate is correct it shows that 29,244 American residents visited Europe from July 1, 1877, to July 1, 1878. This is believed to be about the average of previous years. From information gathered from various sources, it is estimated that two years is the average time spent in Europe by American visitors, while the stay of sight-seers and travellers is, of course, much shorter. Young people, and families who come to Europe with their children for educational purposes, and families who are temporarily residing here for pleasure or for purposes of economy, remain from three to eight and ten years. Families with small children remain often until the youngest has acquired the language of the country and obtained what is termed 'an education.' There are also a large number of American families residing on the Continent, whose heads have amassed fortunes in the United States, who prefer European life, and live expensively—supporting considerable style—but who draw their income wholly from America, either through partnerships in business or from investments, most generally in real estate, bonds, and mortgages.

"The reason generally given by Americans for a temporary residence for a longer or shorter period in Europe is that the *educational institu-*

*tions of the United States do not offer the advantages which they desire for their children.* Families, numbering from five to ten persons, may often be met with who will remain for years in some educational centre while a single member of the household is pursuing a course of studies in institutions of music, art, medicine, or technical science.

"The cost of living, as has been shown, is considerably higher in continental countries than in the United States. It is, therefore, thought not to be an unreasonable estimate to fix the daily average expenditures of each person, including cost of living, education, travelling expenses, and the purchase of expensive trifles, which may be properly enumerated as expenses, at five dollars. Assuming that the current of American first-class travel 'over the sea' to Europe is correctly given as 29,244 per annum, and that the average period of absence is two years, the number of American visitors constantly but temporarily abroad would be 58,488, and their daily expenditures $292,040, or, per annum, $106,594,600, drawn from the United States in gold."

*Its Deflection to Mexico.*—Tourists like change—new places and new sights. When the United States is connected with the City of Mexico by rail, as it will be during the coming few weeks, it is to be presumed a portion at least of the grand army of pleasure seekers will abandon the annual march upon Europe and deflect their course to Aztec or classic America—the land of sunshine and varied attractions. And with this new course of travel there will also be deflected a portion of the many million dollars annually spent for pleasure in Europe. The large and annually increasing summer exodus from the States of the Mississippi Valley to the high elevations of Colorado, and the winter exodus from New England and other Northern States to Florida and other semi-tropical climates, will find similar attractions in Mexico, accompanied also by many additional pleasures.

There is, however, an important distinction between the annual exodus to Europe and Mexico—it will not in the latter case be one-sided. The Mexicans are fond of travel and will on the completion of railway facilities not only take pleasure trips to the United States, but will come here in large numbers for educational purposes, and in many cases, like the Americans in Europe, will reside here for several years.

Again, many would-be-tourists dread the sea voyage to Europe, and will give a preference to the pleasure resort they can reach by rail.

This coming interchange of travel and social intercourse will, we con-

fidently believe, assume very large proportions, and have a wholesome effect upon the commercial and political relations of the two Republics.

The first to reap the benefit of this interchange will be the railways extending from the one country to the other. They will doubtless find it a most important source of patronage and profit.

XII.

## INTER-REPUBLIC POLITICS.

THE political relations of two adjoining countries have an important bearing upon their respective material interests, and for this reason we will very briefly invite attention to a few significant facts, showing the remarkable parallel between the two Republics and the friendly sentiments and actions of each country toward the other.

### A Political Parallel.

The advance guard of European civilization under the lead of Cortez reached New Spain or Mexico in 1519. The Pilgrims landed on the shores of New England a century later, or in 1620.

Mexico was ruled by Spain until it became an independent Republic in 1821. The United States threw off the English yoke a few years before, or in 1776. Each country adopted a constitutional form of government, the organic law of one being in its main features substantially a copy of that of the other. Mexico has twenty-seven States, one Territory, and a Federal District. The other Republic has thirty-eight States, nine Territories, and a Federal District. The Congress of one is composed of a Senate and House of Representatives; that of the other the same.

One Republic was for many years marred by the existence of physical slavery, which was removed in 1863. The other was for years marred by spiritual slavery, which it threw off in 1857.

Each having successfully passed through the political ordeals above mentioned, is making rapid strides in material development and progress, and thereby adding to its political prestige among the nations of the world. Their grand success in the establishment and perpetuity of republican institutions is a spectacle which many liberty-loving people of monarchical countries view with admiration, and are anxious to see imitated at home. The wholesome influence in this respect of these North American Republics will increase and spread. It should never be marred by unfriendly feeling and conflict between the two.

### Mexico's Regard for the United States.

A few years ago it was thought that Mexico was hostile to the advance of American railways, capital, and immigration. Whatever may

have been the sentiments of a few politicians, it is evident that Mexico as a nation has most cordially extended the right hand of fellowship. No better illustration of this friendly feeling can be found than its action in granting railway and other concessions to citizens of the United States.

*Its Concessions in Illustration.*—On this point the Secretary of Finance said in a special report in 1879, on the relations of the two countries: [1]

"Facts demonstrate that, far from the Mexican nation or the Government thinking it dangerous to grant railroad or other concessions to North American citizens, these have constantly received them."

* * * * * *

"The number of concessions granted for the building of railroads since 1865, up till this date, in favor of companies or private parties belonging to the United States, shows that, far from there having been jealousy or want of will on the part of Mexico, with respect to citizens of the United States, they have received the greatest number of concessions that has been granted in favor of citizens of any other foreign nationality, or even Mexicans, if the contracts recently entered into with the several State governments be excepted, admitting that nineteen concessions have been granted to citizens of the United States, while all concessions granted to persons of other nationalities since then are but fourteen, of which four were given to foreigners and the rest to Mexicans."

Since 1879 this friendly policy of Mexico toward citizens of the United States has been emphasized by the grant of many new and important concessions.

The publicly expressed sentiments of many of Mexico's most distinguished statesmen during the past few years afford still further evidence of their friendly feeling and desire for our co-operation in the material transformation and advancement of their country.

## Our Regard for Mexico.

*Sentiments of Prominent Americans.*—In 1825, soon after Mexico became an independent Republic, Senator Benton, of Missouri, presented to the United States Senate a report, prepared at his request, on "the origin, present state, and future prospect of trade and intercourse

[1] Report of the Secretary of Finance, of the United States of Mexico, on the actual condition of that country and its increase of commerce with the United States, pp. 51, 53, and 86.

between Missouri and the internal provinces of Mexico," which he made the basis of a speech on the commercial relations of the two countries. A few days afterwards he reported to the Senate a bill providing for the marking out of a road from Missouri to northern Mexico. In a powerful speech in support of this bill he said:

"The use of an unmolested passage between Mexico and the United States is as necessary in a political as in a commercial point of view. They are neighboring powers, inhabitants of the same continent, their territory contiguous, and their settlement approximating each other. They are the two chief powers of the New World, and stand at the head of that *cordon* of Republics which, stretching from pole to pole across the two Americas, are destined to make the last stand in defence of human liberty."

In the same friendly spirit many prominent Americans have recently expressed their regard for the welfare of the sister Republic.

In a speech in the United States Senate in 1878, Senator Morgan said:

"The inviolability of the boundaries of Mexico includes the duty on our part to respect the sanctity of her borders as we require her to respect ours. * * * Viewing the dangers we have so narrowly escaped, my sympathies for the Mexican people are deeply excited; and when we see them after every new struggle, and after misfortunes, so great and so often repeated, always returning to their first love—a constitutional republic—we must heartily acknowledge that they merit our respect and confidence. Ten million of people thus wedded to liberty, and devoted to the right of self-government, are the worthy friends of this great Republic."

In a speech in the House of Representatives in 1879, Senator Gibson, of Louisiana, said:

"The highest statesmanship is that which brings the nations of the earth into a closer and more intimate friendly communication, which shall enable the people of our country to exchange the products of their labor with the least possible expense and delay for the commodities of other nations. Exchange is wealth. But there are political as well as economical considerations that should induce us to seek a close alliance with the people of Mexico. They are our neighbors. They constitute a sister Republic. We cannot remain indifferent or disinterested spectators of their fortunes or of the destiny of the nine millions of people whose possessions adjoin our borders for more than two thousand miles."

In 1880, Captain Eads, on his return from Mexico, said in a letter to President Hayes:

"A sister Republic with whom we have more intimate relations than with any other of the Spanish-speaking races, and with whom it is our interest to cultivate the most active commercial and social intercourse, and the integrity of whose territory and political institutions it is our interest to maintain against all assailants."

During the same year General Grant said in a speech in New York:

"Now, our unfortunate war has extinguished that institution, (slavery,) we have homogenous institutions from the North to the South, and no one section is dependent upon the acquisition of territory for the purpose of maintaining its institutions. The incentive being gone, ninety-nine out of every hundred people in the United States, who think upon the subject, would be indignant at the suggestion of an acquisition of territory from a friendly power by any unfair or fillibustering means."

In another speech at a banquet at the City of Mexico in the spring of 1881, General Grant said: "I have long been of the opinion that the United States and Mexico should be the warmest friends and enjoy the closest commercial relations."

In February, 1881, Mr. Jay Gould said in an interview in the *New York Herald:*

"In this whole Mexican question, so far as I am concerned, there is a little sentiment commingled with the business side of it. We do not want any more territory. We have just as much as we can manage. We do not want Canada on the north or Mexico on the south. General Grant and the civil war settled that. As a Republic, our duty, it seems to me, is to assist a sister Republic."

In February, 1883, Hon. S. S. Cox said in a letter in response to an invitation to a dinner in Philadelphia in honor of Minister Romero:

"In vain will England or France, or both, try to choke our American enterprise at the Isthmus. In vain will barriers intervene to distract our Republics.

"The stars in their courses will fight for our continental advancement against the aggressions of alien governments and hostile policies.

"It is this horoscope which I tried to cast ever so many years ago. Its 'radiancy was dusked' by many untoward events which have passed into history, but the finger of God, through commerce and adventure, good will, and manly virtues, will point us to a grand future in which the glories of each Republic will be jointly shared by both."

These are but a few of the many friendly sentiments toward Mexico recently expressed by prominent citizens of the United States, both in official and private life. They are sufficient, however, to show that the drift of public sentiment is in the right direction—that fillibustering, crimination, and recrimination between the two countries are matters of the past. Pride, as well as self-interest, in the success and perpetuity of republican institutions require that the two sister Republics rejoice at each other's welfare, both political and material.

# APPENDIX.

## American and English Authorities.

Believing that the coming international celebration on the 5th of May in honor of the completion of the first railway between the two Republics will create a new and general demand for authorities on Mexico, we have prepared a substantially complete list of works in the English language on the history, resources, and characteristics of that country. The several works on the war between the two Republics in 1846–'8 are, however, omitted as of little present practical importance.

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*Alarchon, Fernando.*—Voyage along the Gulf of California in 1540. In Hakluyt's Voyages, III, 505.

*Allen, Fred. H.*—Cortez; or, the Discovery, Conquest, and more recent History of Mexico. Boston, 1881: D. Lothrop & Co.

*Alvensleben, Max, Baron Von.*—With Maximilian in Mexico. London, 1867: Longman, Green & Co.

*Anderson, Alex. D.*—The Silver Country; or, Great Southwest. A review of the mineral and other wealth, the attractions and material development of the former Kingdom of New Spain, comprising Mexico and the Mexican cessions to the United States in 1848 and 1853—with Hypsometric map. New York, 1877: G. P. Putnam's Sons.

*Anderson, Alex. D.*—The Tehuantepec Inter-Ocean Railway. A commercial and statistical review showing its local, national, and international features and advantages. New York and Chicago, 1881: A. S. Barnes & Co. Illustrated with four maps and diagrams.

*Anderson, Alex. D.*—The American and Mexican Pacific Railway or Transcontinental Short Line. Illustrated with 17 diagrams and maps. Washington, 1883: Gibson Brothers, printers.

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Mexico, and those of the new kingdoms of Leon, New Santander, and Texas. Translated from the Spanish. Philadelphia, 1814.

*Aubertin, J. J.*—A Flight to Mexico. With 7 illustrations. London, 1882: C. K. Paul.

*Baldwin, J. D.*—Ancient America. New York, 1872: Harper & Brothers.

*Bancroft, H. H.*—The Native Races of the Pacific States of North America. 5 vols. New York, 1876: D. Appleton & Co. Vol. I on Wild Tribes. Vol. II on Civilized Nations. Vol. III on Myths and Languages. Vol. IV on Antiquities. Vol. V on Primitive History.

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*Barinetti, C.*—A Voyage to Mexico and Havana. New York, 1841: Printed for author.

*Bartlett, J. R.*—Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua, connected with the United States and Mexican Boundary Commission during the years 1850, 1851, 1852, 1853. 2 vols. New York, 1854: D. Appleton & Co.

*Baxley, H. W.*—What I saw on the West Coast of South and North America. New York, 1865: D. Appleton & Co.

*Baz, Gustavo, and E. L. Gallo.*—History of the Mexican Railway. Mexico, 1876: Gallo & Co.

*Beaufoy, Mark.*—Mexican Illustrations. London, 1828: Carpenter & Son.

*Becher, H. C. R.*—A Trip to Mexico. Toronto, 1880.

*Bishop, Anna.*—Travels in Mexico, 1849. Philadelphia: Charles Deall.

*Bishop, William H.*—Old Mexico and her lost Provinces. A Journey in Mexico, Southern California, and Arizona, by way of Cuba. New York, 1883: Harper & Brothers.

*Bonnycastle, R. H.*—Spanish America; or, A Descriptive, Historical, and Geographical Account of the Dominions of Spain in the Western Hemisphere. Philadelphia, 1819: Abraham Small.

*Box, M. J.*—Adventures and Explorations in New and Old Mexico, being the record of ten years of travel and research, and a guide to the mineral treasures of Durango, Chihuahua, the Sierra Nevada, (east side,) Sinaloa and Sonora, (Pacific side,) and the southern part of Arizona. New York, 1869: James Miller.

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*Chaloner and Fleming.*—The Mahogany Tree. Its botanical characters, qualities, and uses, with practical suggestions for selecting and cutting it in the regions of its growth in the West Indies and Central America; with notices of the projected interoceanic communi-

cations of Panama, Nicaragua, and Tehuantepec, in relation to their productions and the supply of fine timber for ship-building and all other purposes. With a map and illustrations. London, 1851: Effingham Wilson.

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*Champlain, S. de.*—Voyage to Mexico, 1599–1602. Translated by A. Wilmere. London, 1859. In Hakluyt's "Voyages," v. 23.

*Chevalier, M. Michel.*—Mexico, Ancient and Modern. London, 1864: John Maxwell & Co. 2 vols.

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*Cluseret, G.*—Mexico and the Solidarity of Nations. New York, 1866: Blackwell, printer.

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*Cortez, Hernando.*—The Dispatches of Hernando Cortez, the Conqueror of Mexico, addressed to the Emperor Charles V; written during the Conquest, and containing a Narrative of its Events. New York, 1843: Wiley & Putnam.

*Cubas, Antonio Garcia.*—The Republic of Mexico in 1876. A political and ethnographical division of the population, character, habits, customs, and vocations of its inhabitants. Mexico, 1876: "La Ensenanza" printing office.

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